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New England Wrestles With Pay Rates

Two Unions Prepare Contracts Without Wage Clause—Strathmore Co. Offers Wage Increase — Worthy Closing Provokes Stir — Wire Weavers End Strike — Stevens Paper Mills To Increase Scale.

HOLYOKE, Mass., November 26, 1945—Two paper industry unions will sign a working contract minus a wage clause with six paper manufacturers, according to a vote taken at meetings this week. The signing will be done by a joint committee of the two unions in the office of Harold T. Martin, labor adviser for the manufacturers.

The wage part of the contract will be discussed at a series of meetings starting next week. At the time of signing, negotiations will be resumed on the demand of the union for a 15-cent-an-hour base pay raise for the 1500 workers involved. Although the wage petition has not been granted by manufacturers when the other features of the contract are signed the unions members will be eligible to receive the retroactive financial benefits from the new agreements.

The two unions voting to sign the contract are the Holyoke Paper Mill Workers, AFL, and the Eagle Lodge of Papermakers, AFL.

It was also learned for the first time that both these unions petitioned on Nov. 14 for a strike vote under the Smith-Connally act. There will be a 30-day period between the petitioning for the vote and the actual voting.

Under the new work contracts a shift differential of four cents for those on the second shift and six cents an hour for the 11 p.m. to 7 a.m. shift will be retroactive to June 1 and the members of both unions will receive holiday pay for July 4th and Labor day. It is believed the retroactive payments will be made at once.

Strathmore Offers Wage Increase

The Strathmore Paper company of West Springfield and Woronoco has offered workers in its four plants a wage increase of five cents an hour in response to a demand of the Tekoa Lodge, International Brotherhood of Papermakers, AFL, for 15 cents an hour.

The 350 workers represented in the four plants will meet soon when they are expected to turn down the company's answer and continue their demands.

At a meeting in West Springfield, Strathmore officials said they would make the five cent increase effective immediately and would initiate a shift differential of four cents an hour for the afternoon shift and six cents for the night shift retroactive to June.

The company has also agreed to straight time pay for three holidays not worked and time and one half for the sixth day whether or not 40 hours have been worked.

The Worthy Paper company here, of which the owner, Gorham Bliss, has announced will be sold or liquidated because of the choice by one vote of the International Brotherhood of Papermakers as the bargaining agent of the workers was seething with activity this week as those in favor of a union urged immediate organization while those opposed urged reconsideration. Frederick Rochford, organizer for the union, said he was "getting all kinds of reports as to the situation" which he plans to investigate. He asserted the company's attitude shows a decidedly hostile spirit toward union in spite of Bliss' insistence that he is not antiunion.

Employes opposing the union are doing everything in their power to discourage those who favor unionism, said Rochford. Much "petty bickering" is going on, he said, and individual employes have a right to do as they wish.

Rochford said those who favor a union are anxious to go ahead with plans for getting the charter and will hold a meeting soon to decide on future steps. He pointed out that the union organized workers at the request of the employes themselves and that no demands have been made of the company as yet.

Mr. Bliss was unavailable for further comment.

Tissue Workers May Demand Higher Wage

Following the lead of Eagle Lodge of Papermakers and local 223, the American Tissue Mills finishing employes are also likely to demand a 15-cent hourly wage increase in their new contract.

The tissue union, Local 203 of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, has called a meeting for this week to nominate officers and plan negotiations for the new agreement.

William Hineline, a representative of the international union, will attend the meeting. The union represents employes of the American Tissue Mills plant. Workers in the company's two mills in South Hadley are enrolled in Eagle Lodge of Papermakers.

Wire Weavers End Strike

The 18 striking wire weavers of the Sinclair Company, out of work for a month, returned Monday morning as a result of a settlement of the nation-wide strike in the industry.

Agreement was reached at a meeting in Cleveland. Peter S. Sinclair head of the Sinclair Company, was there. He said that settlement gives an over-all 8% pay rise and allows a more liberal apprentice system.

(Continued on page 36)

Reports Paper Supply Now at Lowest Level

Midwest Expects Tight Situation To Continue Well Into 1946 — Salesmen Add Members—Pictures Importance of Waste Paper Collections — Professional Group Hear Talk By Major D'a Clark.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 26, 1945—It may be getting to be an old story but the fact remains that the over-all industry outlook in this area continues to be any thing but optimistic. At various trade meetings of a local nature, the report continually comes out that 1946 is expected to be an extremely critical year from the supply standpoint and there are many who indicate that conditions right at this moment are worse than they have ever been. This is reported to be true not only in mill offices but in the jobbing trades where quotas are reported already down to the bone and becoming less and less substantial as the holiday peak comes.

General business plans for 1946, predicated on a wealth of consumer buying and on a desire of all industry to win back its civilian accounts through direct mail and other forms of advertising, are expected to create an even more tight condition. Local paper trade offices were inclined to discount the slight degree of optimism engendered by the report of imports from Canadian and foreign sources. As one trade leader put it, "even with 300,000 tons of imports we would have only a drop in the bucket as far as the general needs of the industry are concerned." Currently, there is reported to be little or no activity at the mills as the shortage of manpower combines with the seasonal conditions to make production of pulp of any tonnage consequence an extremely difficult operation.

Salesmen Add Member—Lose Another

The western division of the Salesmen's Association of the Paper Industry held its regular Monday noon meeting at the Sherman Hotel on November 19. No formal program was presented but there was plenty of discussion over current problems confronting the trade. At the same time, the SAPEYES bid welcome to a returning member and said goodby to another. William "Bill" Nash, Jr., was present at his first meeting following discharge from the Army after many months of service. Bill returns to the Chicago offices of the Nekoosa-Edwards Paper Company. D. D. Thirkield, for seven years associated with Chicago offices of the Sorg Paper Company, was present to sing his "swan song" prior to his returning to the home offices of Sorg at Middletown, Ohio. Meanwhile, the SAPEYES were concluding plans for a fine audience for Rt. Rev. Wallace Edmonds Conkling, chaplain of the SAPEYES, who is to give his annual Christmas message on December 17, and were learning more about the annual Christmas party, under the direction of Ben Babbitt, which is slated for December 20.

Pictures Importance of Paper Salvage

Some idea of the importance of waste paper salvage in this area is indicated by the fact that a page of the annual report of the State Street Council, promotional group servicing Chicago's great shopping district, is dedicated to the waste paper salvage program. Photographs are used to show how the Council aided the drive for waste paper collection by offering prizes to school children and feting the winners of various competitive events. A girl and boy were completely outfitted on State Street as winners in their groups.

Major D'a Clark Impresses Audience

The Chicago Professional Paper Group held one of its most successful dinner meetings at the Chicago Bar Association on Monday evening, November 19. More than 150 members and guests of the fast growing organization attended to hear Major James D'a Clark speak on "Paper Tests—Their Interpretation and Meaning." Those present were loud in their praise of the speaker who has long been associated with the industry and more recently has been actively participating in the work of the Quartermasters Corp in this area. This background permitted Major D'a Clark to present his subject with a good deal of experience and authority behind it and the forceful methods he used plus the extremely active audience participation following his remarks made the meeting a genuine program high light.

President Weston of the Fritz Publications presided at the meeting and turned the introductory job over to Joe Kubicka, Container Corporation of America, program chairman for the Group. Major D'a Clark then discussed many of the tests common to the trade and compared their values in an extremely searching and factful way. The sequence of actual experience revealed some of the strong and weak points of standard testing methods, not particularly exploding any pet theories but indicating where other than commonly accepted methods might be helpful.

Mead to Sell Own Chestnut Board

CHILLICOTHE, Ohio, November 24, 1945—The Mead Corporation, "Paper Makers to America," Chillicothe, Ohio, has announced that it will take over and handle direct the sale, distribution, and merchandising of its own Chestnut Corrugating Board, thus terminating its sales arrangement with The LaBoiteaux Company which, for many years, was responsible for the distribution of a large part of the Corporation's board production.

Mead's Alan G. Goldsmith and Al. H. Mahrt, well known in the packaging industry, will personally supervise this new sales set-up for the Corporation and plans are in the making for a continuous promotional program to acquaint box buyers with the profit potentialities of sturdier, safer shipping containers.

The board products of the Corporation are produced in plants located at Lynchburg, Va., Knoxville, Nashville, and Harriman, Tenn., and Sylva, N. C.

Salesmen Meet in Philadelphia Dec. 3

The Salesmen's Association of the Paper Industry will hold the first meeting of Philadelphia members on Monday, December 3 at Kugler's Restaurant, Widener Bldg., corner of Chestnut and Juniper streets at 12:30 o'clock. E. W. (Ted) Tinker will be the guest speaker. Your reservations should be sent to Tom Hanna, 780 Drexel building, Tel.—Lombard 1150, as soon as possible.

Woods Labor Situation Improving Slowly

Pulpwood Cutting Retarded In Many Districts Through Lack of Adequate Labor—Criticizes British Decision To Use Less Canadian Newsprint — Cuba Uses More Paper — Other Industrial News.

MONTREAL, Que., November 26, 1945—With the problem of woods labor still the key to an adequate supply of pulpwood for full-scale operations in the pulp and paper industry in 1946, advices are that in Quebec province the situation in regard to labor in the woods is improving gradually, but that there is still a demand for a large number of men in face of a continuing strong demand for lumber and pulpwood in both the domestic and foreign markets. In the Maritime Provinces, which are faced with demands for pulpwood, pit props and lumber in excess of available supplies, woods operations are being retarded owing to a lack of sufficient labor.

In general the most optimistic prospects are that by December it may be possible for the complement of men in the woods in Canada to be brought up to between 55,000 and 60,000 men, or somewhere around 10% more than last year. Some improvement in the outlook has come from the federal Department of Labor, which has acquiesced in the continued employment of prisoners of war in the woods during the winter, and has issued a statement that there is no possibility of prisoners of war being repatriated to Europe until late spring at the earliest.

On the other hand, so far as border points in Quebec and the Maritime Provinces are concerned, a complicating factor has been continuation of quota movements of Canadian woodsmen into lumber camps in Maine. About 5,000 to 6,000 men are affected. They are offered wages considerably in excess of the wages prevailing in Canada for similar work. Mostly their stay in the United States is for short periods, but in that time they earn enough to make further work in the woods on their return unattractive.

The British Market for Newsprint

There is evidence of strong reaction in Great Britain over the cancellation by the British Government of import licenses for 224,000 long tons of newsprint which Canadian and Newfoundland mills had contracted to deliver in 1946, with the later concession for token imports of 50,000 tons, which still would force British daily newspapers to remain at the wartime size of four-page issues. Cabled reports quote the trade publication Newspaper World, of London, as saying that "each week brings mounting evidence of the ill effects, both to the industry and to the life of the country, which the maintenance of the present British newsprint ration quotas involves." The London Society of Compositors has sent a resolution to Prime Minister Attlee, referring to "restraint of trade, loss of wages, withholding of information to the public, and hardship to newspaper employees (involving dismissals)," and expressing the opinion that the Government's newsprint policy "amounts to partial suppression of the liberty of the press."

The London Sunday Observer is quoted as saying that more than 3,000 persons soon would be returning to the industry in the London area alone and it would be impossible for them to find employment unless the size of newspapers were increased. Commenting on this, the Newpaper World says:

"This would happen at a time when we are spending £20,000,000 ($80,000,000) a year to import American films but cannot find dollars to pay for Canadian newsprint, thus combining Empire trade with support of a vital industry here."

Cuba Uses More Newsprint

J. L. Mutter, commercial secretary in the Canadian Legation at Havana, reports on the growth of the market for Canadian newsprint in Cuba, saying that exports of newsprint from Canada to that country rose from $338,390 in 1938 to $571,040 in 1943. Estimating the future trend on the basis of certain known facts, he says: "In the case of newsprint, Canada's present position appears to be secure for some years to come. Contracts now in force should keep Canadian mills in a commanding position until 1949, while Scandinavian competitors, handicapped by shipping shortages and unsettled conditions in the producing countries, will doubtless concentrate their activities upon markets nearer at hand. Moreover, Cuban newspaper publishers no doubt appreciate the efforts of Canadian shippers to meet their essential requirements during the war years."

Newsprint Production in Newfoundland

Advices from Newfoundland are that both the newsprint plants in that country are continuing to operate at capacity. J. C. Britton, Canadian Trade Commissioner at St. John's, reports that the total newsprint of the two Newfoundland concerns for 1945 is estimated at 380,000 tons, and the production of sulphite pulp at 60,000 tons. The mills employ 3,200 persons in strictly mill operations, the number working in the woods varying considerably, with a peak employment in the fall months of about 6,000 men. He adds that while the mills have been operating at capacity, they have been investigating the possibility of increasing their range of products to include products other than newsprint and pulp. The best prospects, he says, would appear to be for wallboard, wrapping paper and cardboard.

St. Regis Enlarges Plant

The St. Regis Paper Company (Canada) Limited are constructing a large addition to their plant at Cap de la Madeleine, Que., to provide additional production capacity as well as additional storage space for raw materials and finished products. The new building is a one-storey structure with an area of 52,000 square feet. It will also provide additional office space, employees' recreation room, cafeteria, first-aid room, etc.

Howard Smith Paper Mills Limited are erecting an addition to their soda mill at Cornwall, Ont., to provide more pulp washing facilities.

Paper Machinery Firm Expanding

Sherbrooke Machineries Limited, Sherbrooke, Que., are this month completing a new building, costing approximately $35,000, for the assembly of pulp and paper mill machinery. Two 10-ton cranes have been installed to facilitate handling of machinery.

News of the Wisconsin Paper Industry

Newspaper Editorial Supports Recruitment Drive For More Mill and Woods Workers—Reports On Stumpage Sales—Paper Mills To Increase Wages 15 Cents Per Hour — Other Late Mill News.

APPLETON, Wis., November 26, 1945—A plea for support to the current recruitment campaign for woods and mill workers being conducted jointly by the pulp and paper industry and the United States Employment Service was made last week in an editorial in the Wausau Daily Record-Herald, Wausau, Wis.

"It is all very well to know that paper comes from pulpwood cut from forests and farm woodlands, that pulp and paper is America's sixth largest industry," the editorial said, "or that the industry employs more than 300,000 in woods and mill work at an annual payroll cost of $500,000,000. The truth is that all of these assorted facts and figures are merely incidental, capable even of hiding the true view of this industry's vital importance to those who live here.

"Steel, oil, textiles, automobiles and meat packing may be larger than the pulp and paper industry but their manufacturing is located mostly in big cities. More than 80% of the pulp and paper mills of this country are located in cities of less than 100,000 population, and of these, more than 75% are located in cities of less than 10,000 population.

"In other words, despite its great size, the pulp and paper industry is really a small town industry, our own industry, operating in and dependent on communities like this for its workers and its raw materials.

"With a record for stability unequalled by any other major American industry, and with its future prospects brighter than ever before, pulp and paper holds forth a promise of glowing prosperity for this community and an important cushion against the shock of future depression.

"That is why the current recruitment campaign . . . is important to every one of us; it is also why in this period of reconversion when pulpwood and pulpwood products are so important, this community must do its share in meeting the urgent need of mills in this area for more spruce and balsam now."

Paper Mills to Increase Wages

Wage increases involving an ultimate increase of 15 cents an hour and affecting about 3,700 employes of the Consolidated Water Power and Paper Company of Wisconsin Rapids and of the Nekoosa-Edwards Paper Company of Port Edwards and Nekoosa, Wis., were announced November 21.

About 2,500 hourly-paid workers in six Consolidated divisions are to receive an increase of 5 cents an hour, effective November 19, with an additional increase of 10 cents beginning January 28, 1946. Those now on a 40-hour week are to receive the entire 15 cents immediately and others also will receive the 15 cents when they go on a 40-hour week. The arrangement applies to the Wisconsin Rapids, Biron, Interlake (Appleton), Stevens Point, Wisconsin Rapids and Plastics divisions, the latter also being located at Wisconsin Rapids. Negotiations were completed November 20.

Approximately 1,200 Nepco employes at Port Edwards and Nekoosa will receive an increase of 5 cents beginning November 26 and an additional 10 cents, effective February 4, 1946. In the negotiations completed November 21, Joseph Besch, Chicago, represented the International Association of Machinists; Walter Trautmann, Milwaukee, represented the International Brotherhood of Pulp, Sulphite and Papermill Workers, Edward G. Gilbertson, Wisconsin Rapids, represented the International Brotherhood of Papermakers.

Ralph Gehring Heads River Control Assn.

Ralph Gehring, town of Bovina, near Appleton, was elected president of the Fox and Wolf Riven Control Association at a meeting November 19 at Kaukauna, Wis. Herbert Weckworth, Kaukauna municipal utilities superintendent, was elected secretary and treasurer, and Judge Gerald Jolin was named counsel.

Mr. Gehring appointed a committee to consider employment of an executive secretary. The latter will collect data preparatory to formulation of a program which will suit the common objectives of the numerous interests concerned with water use in the area.

The objective of the organization, which was formed October 27 at a meeting called by Judge Jolin, is to find a way to eliminate springtime Wolf river flood and stabilize the water of the Fox river.

Mayor Leo J. Promen of Fond du Lac, Wis., was named to represent the association at a meeting in Oshkosh, Wis., on November 29 when the war department will consider changes in the navigational program of the Upper Fox river.

A delegation of the High Water Relief Association of the Winnebago basin attended the meeting and offered to cooperate with the control association. Also attending the meeting was Charles Seaborne of Thilmany Pulp and Paper Company, Kaukauna, Wis.

Reports on Stumpage Sales

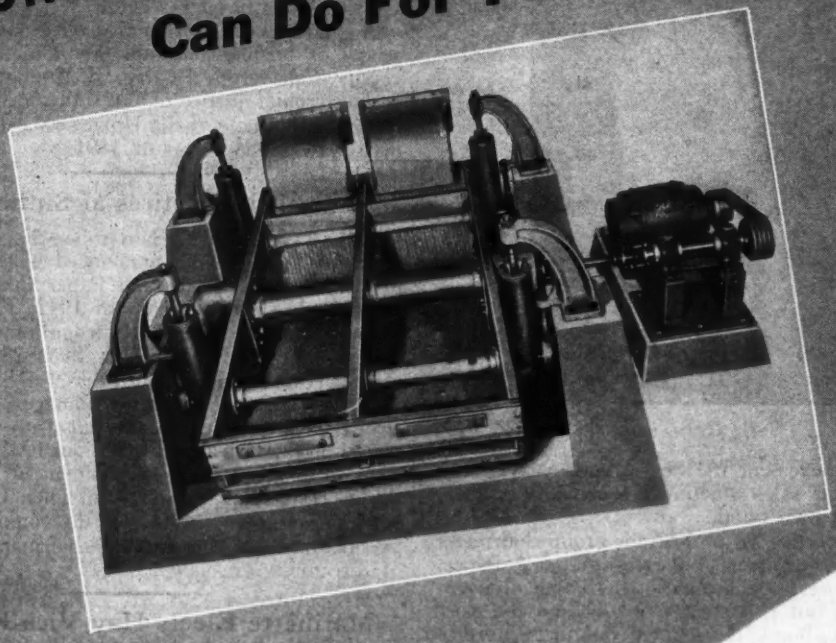
Timber stumpage sales from forest crop and county-owned lands may fall below the high of $22,000 in Marinette County, Wisconsin, this year, but the retirement of county hospital bonds, for which the profits of the sales are utilized, may be greater than last year, according to a report by Charles B. Drewry, Marinette County agricultural agent.

Sales during the first 10 months of this year totaled $14,229.97, but Mr. Drewry said that indications are that the figure will reach at least $20,000 by the end of the year. The figure reported is the amount actually paid to the county and does not represent a large number of contracts not yet paid.

The output of timber products, it was stated in the report, even with labor shortages, has increased over previous years, especially in the production of pulp and boxwood. Up to November 1, there was a grand total of almost 20,000 cords of pulp and boxwood, and almost a million board feet sold from county-owned lands.

Navigation on the Fox river, the Wolf river to New London, Wis., and on the Upper Fox river and Lake Winnebago closed at 4 o'clock Saturday afternoon, November 26.

Here's What This JONSSON SCREEN FOR PULP Can Do For You



- It turns out a big volume of clean pulp.
- It gets the rejects out without appreciable loss of good stock.
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Now is the time to get the whole story on the Jonsson Screen (patented) from

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Hinman Heads Victory Loan Drive

The fourteen basic trade groups of the Paper Industry of New York constituting a division of the War Finance Committee for Greater New York in the Victory Loan are driving toward their goal of $15,000,000 in Victory Bond sales and the committeemen's latest reports indicate they will match their

J. H. Hinman

remarkable achievement of the Seventh War Loan when their total sales amounted to $29,695,521 or 198 per cent of their quota.

At a recent meeting of the 14 trade group-chairmen, J. H. Hinman, president of the International Paper Company and over-all chairman of the Paper division urged them to put persistent effort behind the sale of the $1000 E-Bond. He pointed out that this denomination of the E-Bonds not only possesses the most attractive investment value but the purchaser of one or more of these bonds is qualified for membership in the Victory Legion, an organization inspired by the slogan, "Bring the Boys Home." Mr. Hinman has served as chairman of the Paper division of the War Finance Committee in the last five War Loan drives. F. A. Auffermann Jr., assistant secretary of the International Paper Company is assisting him as co-chairman of the division.

Coated Paper Makers to Meet

The Coated and Processed Paper Association, affiliated with the American Paper and Pulp Association, will hold its next annual meeting, not convention, on February 25, 1946, at the Hotel Commodore, New York, at 10:00 A.M. The meeting will be followed by a luncheon of members of the Association and their guests, both meeting and luncheon being held in the Club Suite of the hotel.

Winans Joins Bonded Products

Herbert Winans, who for the past three years has been connected with the War Department, handling purchases on a wide variety of paper and paper products for the U. S. Armed Forces, has become associated with Bonded Paper Products Company, Long Island City. Mr. Winans is well known in the paper trade, having been associated with it for more than twenty years.

L. L. Callaway Joins Bryant

Kalamazoo, Mich., November 21, 1945—Allan B. Milham, president of the Bryant Paper Company, today announced the election of L. L. Callaway, Jr., as vice president. Callaway comes to Bryant direct from the forest products division of the war production board. He had first served in the division as deputy director and later as acting administrator of order L-244. Prior to his service with the war production board he served as a lieutenant in the navy. He was associated with Time, Inc., in an executive capacity before he volunteered for service in the United States naval reserve.

A graduate of Dartmouth College and also of the school of business administration of Harvard University, Callaway is a native of Montana. His father, formerly chief justice of the supreme court of Montana, is a graduate of the University of Michigan and of its law school, class of 1891.

Rutledge Retires at Sutherland

Kalamazoo, Mich., November 26, 1945—Robert E. Rutledge last week announced his resignation as president of the Sutherland Paper Company, a post he has held since February of 1942. The resignation is to be effective Dec. 31. Rutledge joined the Sutherland organization in October of 1928 as salesman, after a year and a half with the Mac-Sim-Bar Paper Company. He became sales manager in 1932, was elected vice president of the company in 1935, was placed on the board of directors in 1937, and took the position of executive vice president in 1940. He was made president two years later when L. W. Sutherland, one of the founders of the company and then president, resigned to become chairman of the board of directors.

Marinette Elects Hay Vice-President

Glens Falls, N. Y., November 24, 1945—John B. Hay has been elected vice-president of the Marinette Paper Co. The directors also announced the election of C. Edwin Ireland as assistant treasurer and Samuel Armstrong as assistant secretary. Mr. Ireland is also assistant treasurer of the Scott Paper Co., the parent organization, while Mr. Armstrong is a member of the legal staff.

In his new position Mr. Hay will direct all operations at both the Glens Falls and Fort Edward branches. He has been general manager of both plants since last July and prior to then he was director of product standards at Chester. Earlier he was export sales manager of the company.

Union Bag Promotes Leonard Doyle

Leonard J. Doyle has been promoted to the post of general sales manager of Union Bag & Paper Corporation. Mr. Doyle has been with the Union organization since 1912, excepting only the period when he was with the armed forces during the first World War. He is well known to the industry, having at one time been western sales manager for the company and recently sales manager of the bag and paper division. He brings to his new position a sympathetic and practical appreciation of sales problems having started out, himself, as a field salesman for the company in 1919. His earlier service with the company was in the bag factories at Hudson Falls, N. Y., which is his home town.

G.P.O. Calls for Bids

WASHINGTON, D. C., November 21, 1945—Bids will be opened on December 10, for paper for use of the Government Printing Office for the three months' period beginning January 1, by the Joint Congressional Committee on Printing. The Committee will meet one week later to consider awards. They will ask for the following paper:

500,000 pounds newsprint paper.
200,000 pounds telephone book news.
1,950,000 pounds machine-finish book paper.
200,000 pounds English-finish book paper.
2,600,000 pounds offset book paper.
50,000 pounds antique book paper.
50,000 pounds light-weight machine finish book paper.
90,000 pounds 50% antique book paper.
800,000 pounds supercalendered book paper.
700,000 pounds machine-coated book paper.
40,000 pounds dull coated book.
1,600,000 pounds mimeograph paper.
200,000 pounds duplicator copy paper.
100,000 pounds U S M O safety writing paper.
7,400,000 pounds writing paper.
500,000 pounds map paper.
610,000 pounds manifold paper.
1,700,000 pounds bond paper.
1,150,000 pounds ledger paper.
790,000 pounds index paper.
165,000 pounds cover paper.
150,000 pounds manila paper.
40,000 pounds drumhead manila.
300,000 pounds kraft paper.
40,000 pounds blotting paper.
100,000 pounds tag board.
310,000 pounds calendered tag board.
50,000 sheets railroad board.
250,000 pounds wood cardboard.
3,000,000 pounds postal card paper.
100,000 pounds news board.
270,000 pounds binder's board.
160,000 pounds chestnut cover board.

Where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

Study Import Duty Rates

"Within the next four months the paper industry will have some definite information as to the extent to which proposals will be made for the revision of existing duty rates on paper," according to Warren B. Bullock, Manager of the Import Committee of the American Paper Industry. "Preliminary studies of the provisions of existing agreements with United Kingdom, Canada, France, Belgium, Holland and Czecho-Slovakia already are being made at Washington, and new agreements are in contemplation with Russia, China, New Zealand, Australia and South Africa. Duty rates were reduced by the old agreements, each of which contained some provision for reduced tariffs on paper, but the new agreements are proposed with countries which do not ship, but which might be persuaded to import larger volumes of American paper."

This statement was made in a recent report to the industry, which is expected to be affected to some extent by pending proposals.

Customs officials have decided several issues which have been pending for some time. Coating raw stock has been held to be dutiable as paper not specially provided for at 30 per cent, insulation board has been valued for duty purposes at the Canadian market price and not at the lower price for which it is sold in this market, and wrapping paper in part only of kraft has been held dutiable as wrapping paper at 25 per cent and not as kraft wrapping at 20 per cent. The lower rate is permitted only for pure sulphate paper.

Amendment 8 Removes Handicaps

WASHINGTON, D. C., November 27, 1945—Amendment 8 to MPR 450 removes the present handicap of government agencies in buying special government grades of fine paper in competition with other purchasers, by allowing the U. S. Government or any agency thereof to make purchases on the same basis as other purchasers.

Previously, special spelled-out prices for sales of these grades to the government were far below the spelled-out prices for other classes of purchasers. As a result, mills were unwilling to bid on government contracts for these grades leaving the government without adequate paper, or compelling the government to resort to paying the merchant's resale prices (contrary to customary practice).

This action deletes the spelled-out prices on the following special government grades when sold to the U. S. Government or any agency thereof:

	Per cwt. less Discount of 3%
100% rag bond	$25.00
25% rag mimeograph	10.50
Chemical woodpulp manifold	10.25

Although the manufacturers' Industry Advisory Committee opposed Section 16 of the Regulation when it was written, urgent need for action has become more apparent. Permitting direct sales to the government on the same basis as all other types of sales made by paper manufacturers will actually result in lower net prices to the government in many instances and will allow the government to secure its normal tonnages of these papers directly from the manufacturers.

Picola Retires from Gotham Companies

B. F. Picola, formerly general manager, vice-president and treasurer of Gotham Tissue Corporation of Salem, N. Y. and Gotham Paper Mills, Inc. of Battenville, N. Y. has sold his interests in those companies to Michael Gilman and Mrs. Mary Gilman of New York City.

Mr. Picola has been identified with the production and sale of tissue products, particularly toilet tissue, since 1910, and is widely known throughout the entire industry. He has been an active member of the Tissue Association, serving for approximately 20 years as its treasurer, and a member of the Board of Directors of both the Tissue Association and the American Paper and Pulp Association. Upon his return from a well earned vacation, Mr. Picola will again definitely reestablish his activity in the production and sale of tissue products.

Craftsmen Plan Christmas Party

The New York Club of Printing House Craftsmen will hold their annual Christmas party on Thursday, December 20, at 6:30 P.M., at the Building Trades Club, 2 Park Avenue. Henry White, Second Vice-President, Chairman of the Entertainment Committee, declares that anyone who has attended the Craftsmen Christmas party in the past will know they will be assured of a good time. There will be professional entertainment, prizes, and many other features, which will assure everyone of a pleasant evening.

The cost of the tickets for the Christmas party will be $4.50 each. Reservations should be made as soon as possible to: Mr. Reuben Goldman, Palmer & Oliver, 438 West 37th street, New York City.

Obituary

Clarence W. Noble

HOOSICK FALLS, N. Y., November 24, 1945—Clarence W. Noble, president of the Noble & Wood Machine Co., died this week at his home following a brief illness. He was born at Lawrence, Mass., in 1879 but moved to this village in his early youth where his father founded the machine firm. He was a former trustee of the village; past president of the Hoosick Falls Country Club; past president of the Maple Grove Cemetery Association, and a director of the Blanchard Co., of Troy. The principal survivors are his wife and a brother.

Samuel Cowles

WORONOCO, Mass., Nov. 17—Samuel E. Cowles, 71, former head millwright of the Strathmore Paper company plant here and noted as an inventor of many machines used in the business, died in Feeding Hills, Mass., the 12th after a long illness. He had retired in 1934.

Ray C. Sheldon

BELLOWS FALLS, Vt., November 24, 1945—Ray C. Sheldon, 65, for several years manager of the Robertson Paper Company, died November 18. His wife, his mother, two sisters and four brothers are living.

Marinette to Start Towel Production

FORT EDWARD, N. Y., November 24, 1945—The plant of the Marinette Paper Co., a branch of the Scott Paper Co., Chester, Pa., plans now to start its program with paper towels. In a few weeks it is expected that waxed paper also will be turned out. Later on the firm plans to start producing toilet tissue and other products.

Four machines are ready for production in the mill but there is room for several more. Adjoining the boiler room is a huge cylindrical building where several thousand tons of fine coal can be stored. The railroad on the property has been overhauled and improved. The finishing room is being prepared and will have all modern installations. Offices are located on the second floor but eventually these will be moved to another section in order to concentrate production on the ground floor.

Gibraltar Plant to Start in June

NORTH BERGEN, N. J., November 26, 1945—Gibraltar Corrugated Paper Company, Inc., has started construction of a paperboard mill on premises in this town. The mill will consist of a 140-inch cylinder machine with complete steam and power generating facilities. Total expenditure is estimated to exceed $1,000,000. The mill is scheduled to be in operation in June, 1946.

Construction contract has been awarded to M. Shapiro and Sons Construction Company, Inc., of New York. Johnson & Wierk, Inc., of New York, are Consulting Engineers. H. L. Joachim, Vice President of Gibraltar, is in charge of the project for the company.

Cole Resigns at Chesapeake Board

BALTIMORE, Md., November 26, 1945—Chauncey E. Cole has resigned as general superintendent of the Chesapeake Paper Board Company.

Utility's Litigation with I. P. C. Ends

Bartholomew A. Brickley, trustee for the International Hydroelectric System, filed a petition in Federal Court, Boston, Mass. on November 23, asking for approval of an agreement between IHES and the International Paper Company in a compromise settlement of litigation and claims for $13,000,000.

Previously Brickley, acting for IHES had brought suit against the paper company and the International Paper & Power Co. for $96,000,000.

The settlement is in relation to claims and litigations arising out of the sale to IHES of certain stock of the New England Power Association, water power sites and property.

The petition asks for the authority to carry out the terms of the agreement.

The settlement provides for payment of $10,000,000 in cash to the IHES and purchase by the International Paper Co. from Hudson River Power Corp., a subsidiary of IHES, of $3,000,000 in second mortgage bonds.

John H. Hinman, president of International Paper Company, in a statement commenting on the settlement, stated that the paper company "has been advised that it has no liability with respect to these suits."

It is the position of the company, however, that they constitute an obstacle to operations sufficiently important to justify it in making a settlement.

Pacific Mills Opens Night Classes

VANCOUVER, B. C., November 15, 1945—Technical training classes to enable ex-servicement to speedily re-establish themselves in industry is the main purpose behind night school classes being held at the Vancouver converting plant of Pacific Mills, Limited. "The Course will enable ex-servicemen to make up for time lost while in the services," state foremen who have volunteered their time and services in order that the classes could be given. Lectures are given every two weeks on such subjects as paper making, types and methods of printing, and the operation of paper converting machines. In addition to the lectures, there are tours of other plants and practical work on machines. Besides the ex-servicemen, other employes of the company find the course of value in giving them a greater knowledge of the industry. These classes, which have proven very popular with the ex-servicemen, are part of the company's rehabilitation scheme.

Brotherhood Re-elects Burns

ALBANY, N. Y., November 24, 1945—Several executives of the International Brotherhood of Papermakers were re-elected at a recent meeting of the organization. Among those re-elected without opposition were Matthew J. Burns, Albany, president; Paul L. Phillips, Camden, Ark., first vice-president; J. Arthur D'Aoust, Hull, Que., fourth vice-president; Russell Drummond, Portland, Ore., fifth vice-president; Harvey A. Raymond, St. Catherines, Ont., seventh vice-president, and David S. Larner, Tonawanda, auditor. Elected in contests were Joseph Addy, Troy, secretary-treasurer; Frank P. Barry, second vice-president, and John W. Bailey, Kalamazoo, Mich., third vice-president. Another election is scheduled between John R. Jones, of Boston, incumbent, for sixth vice-president and Mark Fisher, of Chattanooga, Tenn. Neither received a majority in a race with Emil Noren, Marathon, Wis., who ran third.

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FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending November 26, 1945

STOCKS

	High	Low	Last
A. P. W.	9	8⅝	8⅝
Armstrong Cork Co.	57½	53	54¼
Celotex Corp.	20	19½	19½
Celotex Corp., pf.	21¼	20¼	20¾
Certain-Teed Products Corp.	15	14⅛	14¼
Certain-Teed Products Corp., pf.	...	...	...
Champion Paper & Fibre Co.	49½	48	48
Champion Paper & Fibre Co., pf.	112	111	111
Congoleum Nairn Co.	34⅛	33½	33½
Container Corp. of America	40	37	37
Continental-Diamond Fibre Co.	15⅞	15½	15¾
Crown-Zellerbach Co.	30	28⅛	28½
Crown-Zellerbach Co., pf.	109½	108½	108½
Dixie Cup Co.	47	45½	45¾
Dixie Cup Co.—A	53¾	52½	52½
Flintkote Co.	36⅜	35¼	35¼
Flintkote Co., pf.	111½	111	111
Robert Gair	10⅛	9⅜	9½
Robert Gair, pf.	19¾	19⅛	19⅜
International Paper Co.	44½	41⅜	44
International Paper Co., pf.	114¾	112½	113¼
Johns-Manville Corp.	145	139¼	139¼
Johns-Manville Corp., pf.	132¾	131	131
Kimberly-Clark Corp.	62	60	61½
Mac Andrews & Forbes	35	35	35
Mac Andrews & Forbes, pf.	154½	154½	154½
Masonite Corp.	60	58¼	58¼
Mead Corp.	21¼	19⅛	19⅛
Mead Corp., pf. A—6%	...	...	...
Mead Corp., pf. B—5½%	106	104	105½
National Container Corp.	26½	24½	25
Paraffine Companies, Inc.	80	80	80
Paraffine Companies, Inc., pf.	...	...	...
Rayonier, Inc.	23½	21¾	22½
Rayonier, Inc., pf.	38	37¾	38
Ruberoid Co.	47	45¾	45¾
Scott Paper Co.	...	...	...
Scott Paper Co., pf.	111¾	111¼	111¼
Sutherland Paper Co.	40	39⅞	39⅞
Union Bag & Paper Corp.	25	23¾	23¾
United Paperboard Co.	10¾	9⅞	9⅞
U. S. Gypsum Co.	103¾	101	101
U. S. Gypsum Co., pf.	195½	195½	195½
West Virginia Pulp & Paper Co.	35⅞	35	35
West Virginia Pulp & Paper Co., pf.	115	115	115

BONDS

Abitibi Pulp & Paper Co. 5s '53	...	...	...
Celotex Corp. 3¾s '55	...	...	...
Certain-Teed Products Corp. 5½s '53	...	...	...
Champion Paper & Fibre Co. 3s '65	102¾	102¾	102¾
International Paper Co. 6s '55	107½	107½	107½
International Paper Co. 5s '47	103½	102⅞	102⅞
Mead Corp. 3½s '53	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending November 26, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	44¾	43½	43½
Hummel-Ross Fibre Corp.	12¼	11⅝	11⅝
St. Regis Paper Co.	10⅞	10½	10½
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	9¼	8⅞	8⅞

BONDS

American Writing Paper Co. 6s '61	101¾	101¾	101¾

Warren Refinances for Improvements

WESTBROOK, November 24, 1945—The proposed sale of $5,500,000 in preferred stock and bonds was announced here recently by the S. D. Warren Co., and of this amount, $1,500,000 will be "new money" or funds for modernization and expansion of the company plant. The organization has registered 30,000 shares of no-par-value $4.50 cumulative preferred stock with the Securities Exchange Commission in Philadelphia. This stock will be offered for sale by the First Boston Corporation and other underwriters. The company also announced that it had entered into contracts for the private sale of $2,500,000 of first closed mortgage 20-year 3¼ per cent sinking fund bonds. Maine investment authorities say that 3¼ per cent is the lowest rate at which a Maine paper company has ever borrowed money. Of the money raised from the sale, $4,140,000 will be used to redeem $4,000,000 of outstanding first closed mortgage 15-year four per cent sinking fund bonds due in 1959.

Brown Company to Pay Bond Interest

BERLIN, N. H., November 22, 1945—Brown Company, manufacturer of pulp, paper and allied products, on December 1 will make the semi-annual payment of interest on its general mortgage 5% cumulative bonds for the six months ending November 30. Checks will be mailed on December 1 to registered owners at the close of business November 30. F. G. Coburn, president, urged that scrip certificates for fractional shares of voting trust certificates for preferred and common stock be surrendered for redemption on or before February 6, 1946, after which date the scrip certificates outstanding become null and void. In the United States, Old Colony Trust Co., Boston and Chase National Bank, New York, are Scrip Agents for Preferred; State Street Trust Co., Boston and Continental Bank and Trust Co., New York are Scrip Agents for Common.

He also reminded holders of Brown Company's old securities outstanding at the time of reorganization of the Company, on November 29, 1941, that these must be exchanged for new securities in the reorganized Company on or before April 5, 1948, after which date they become void by court order. This applies to First Mortgage 5½% Gold Bonds, or Certificates of Deposit or Deposit Receipts for such bonds; and old 6% Cumulative Preferred Stock or Certificates of Deposit for such stock.

National Container Reports Sales Up

Consolidated net sales of National Container Corporation and its subsidiaries for the period January 1 to September 30, 1945, amounted to $14,344,230.77 compared with $13,174,501.75 for similar period in 1944. Consolidated net sales for the third quarter of 1945 totals $4,516,946.54 compared with $4,373,203.35 in the third quarter of 1944.

Net profit for the period January 1 to September 30, 1945, after all charges including estimated Federal normal, surtax and excess profits taxes total $952,945.84, which after provision for preferred dividends, amounted to $1.40 per share on 660,964 common shares outstanding, as compared with $921,891.61, or $1.39 a common share for the period January 1 to September 30, 1944.

Net profit after all charges including estimated taxes for the third quarter of 1945 total $320,571.89 which after provisions for preferred dividends amounted to 45 cents per common share as compared with $332,926.24 in the third quarter of 1944.

Southern Files with SEC

The Southern Advance Bag and Paper Company, Inc., Boston, Mass., filed a registration with the SEC for 25,000 shares of $100 par value 4½% cumulative preferred stock. The company is offering holders of its recently outstanding 7 and 6% cumulative preferred stock the right to exchange their shares for the new stock. Shares not exchanged will be redeemed.

An aggregate of 20,209 shares of 4½ per cent preferred will be offered for the exchange. The remainder, along with shares not exchanged, will be offered publicly.

Great Northern Profits Off

The Great Northern Paper Company and wholly owned subsidiaries for nine months, reports a net profit of $851,707, or 85 cents a share, compared with $1,310,951, or $1.31 a share last year.

Wausau Co. Elects Officers

BROKAW, Wis., November 26, 1945—The Wausau Paper Mills Company, held its stockholders and directors meeting recently at its offices. At the same time and the same place stockholders and directors of the Yawkey-Alexander Lumber Company held their annual meetings.

Officers and directors of both companies were re-elected. J. S. Alexander was retained as chairman of the boards of both companies. Others reelected to serve both companies: Harold C. Collins, president; L. W. Holbrook, Washington, D. C., vice president, and Aytch P. Woodson, secretary, the latter being also treasurer of the Yawkey-Alexander Lumber Company.

D. C. Everest is treasurer of the paper mills company, and Glenn Stevens is assistant secretary and assistant treasurer. Carl Magnus is vice president in charge of production, and Harold R. Knott is vice president in charge of sales. Directors of Wausau Paper are Mr. Alexander, Mr. Collins, Mr. Holbrook, Mr. Magnus, Mr. Woodson, Mr. Everest and Mr. Hoeper.

Mr. Collins, as president of the paper mills company, reported a satisfactory years and said that prospects for the coming year appear bright. He announced that the village of Brokaw has installed a complete water works and sewage system which will afford fire protection and which marks a decided step in the progress of the village. He reported that the mill will use about three-fourths of this supply when the new system begins operating in December.

Eastern Corp. Earnings Lower

BANGOR, Me., November 24, 1945—The Eastern Corporation announced recently that net earnings for the first nine months of 1945 had declined $51;519 below those for a like period in 1944. Earnings for this year reached $367,561, while those for the nine month period last year were $419,080. The 339,439 shares of common stock which make up the capitalization of the company, earned $1.08 a share against $1.91 a share last year. Current assets exceed current liabilities in the ratio of seven to one.

Net sales for the latest nine months were $7,598,579 compared with $7,048,618 a year ago, while operating expenses were $6,468,948 and $5,829,290, respectively. Clyde B. Morgan, president, said the net profit for the third quarter was $125,549.

Celotex Increases Directorate

At a special meeting of the Celotex Corporation on November 20, stockholders approved an increase in directors from nine to eleven and the division of the directors into classes with about one-third coming up for re-election each year, and ratified an amended certificate of incorporation containing several changes in the by-laws.

The new directors are Albert C. Simmons, Jr., vice president of the Bank of New York, and Parrish Fuller of Louisiana, lumber manufacturer and vice president of Hillyer-Deutch-Edwards, Inc.

Dunn Back at Old Stand

BOSTON, Mass., November 19, 1945—Melvin F. Dunn, Master Sergeant, U. S. A., has returned to the sales staff of Percy D. Wells, Inc., 150 High street, fine paper merchants, following almost four years of service in England, France and Belgium.

Gair-Santee Plans $12,000,000 Mill

COLUMBIA, S. C., November 21, 1945—The Gair-Santee Corporation of Orangeburg County, a subsidiary of Robert Gair, Inc., of New York City, will erect a $12,000,000 paper board and box factory on the upper lake of the Santee-Cooper development, 14 miles from Orangeburg. Establishment of the new factory, which will have a payroll of $25,000 per week, was assured with the signing of a contract November 20 between the South Carolina Public Service (Santee Cooper) Authority and the Gair-Santee Corporation.

From pine and hardwood pulp the new mill will make boxboard material for shipping containers. In addition to the huge plant, Gair-Santee plans to erect a model village of 500 homes which will house a population of some 2,500 people. There will be homes for company executives, too.

Gair-Santee Corporation has already opened offices in Orangeburg. T. W. Earle, vice-president, said he did not know the exact date at which construction of the plant would actually get under way. The new plant will be near the southern terminus of the Francis Marion bridge of U. S. Highway No. 15, across Lake Marion. It will be about 50 miles from Columbia and, by water, about 90 miles from Charleston.

Mr. Earle said the product of the plant will be moved largely by water to Charleston, by way of the Santee-Cooper lakes and the Cooper river. This will mark the first systematic use of these waters for commercial navigation, it was pointed out. A public harbor, with a minimum depth of 12 feet is to be provided at which lighters will load and unload.

"We welcome this new industry to our State," said R. M. Jeffries, general manager of Santee-Cooper. "It will not use a large amount of Santee-Cooper power, but anything that will build up the coastal country will help Santee-Cooper and will have its backing.

State Senator T. B. Bryant, Jr., of Orangeburg, commented: "When this plant is completed it will be the largest by far in the county, and the county welcomes it. I am delighted that the negotiations are completed and that work will soon begin. It is my studied judgment that the location of this plant in Orangeburg county will be a tremendous asset for the economic development of the entire section."

Under the contract signed here yesterday, the Gair-Santee Corporation acquires 300 acres of land for $17,500. In addition, the agreement calls for payment to the Santee-Cooper of $3,500 for the first 25 years of operation for water rights and other easements and for payment of $1,500 for the next 25 years.

These payments, all told, aggregate $142,500 to the South Carolina Public Service Authority.

Signing the contract in behalf of Gair-Santee were T. W. Earle, vice-president, and R. B. Trotman, assistant secretary and treasurer, and for Santee-Cooper, Mr. Jefferies and John Ziegler, secretary-treasurer.

Dynes Joins Hollingsworth & Whitney

WATERVILLE, November 24, 1945—Charles J. Dynes, formerly deputy director of the Paper Division of the War Production Board, has been appointed director of sales planning at the Hollingsworth and Whitney Company, James L. Madden, president. Mr. Dynes will make his headquarters at the Boston office, 60 Batterymarch Street. Before joining the War Production Board, he was employed by the Sorg Paper Company.

Silicone Resins Raise Insulation Operating Temperature Limits

By R. F. Horrell, Design Engineer
Motor Engineering Department Westinghouse Electric Corporation

Applying silicone resins to insulating materials makes possible a weight reduction of 50 per cent in certain general purpose industrial motors. These resins, when used in combination with inorganic insulating substances such as; mica, asbestos, and Fiberglas, produce materials which have a higher thermal endurance than the conventional materials in use today, as these are restricted by temperature limits set by The American Institute of Electrical Engineers Standards No. 1. These temperatures are based on the thermal endurance of the conventional materials and such endurance become the primary basis for establishing general machine ratings. Therefore, any development which greatly improves the thermal endurance of insulation is of real importance to the user of industrial motor equipment. However, there are frequently other design considerations which outweight thermal endurance so that on some equipment little advantage can be gained. Each application must, therefore, be analyzed carefully by the design engineer.

"What is silicone?" and "In what form is it available?" Silicone is a generic name applied to a considerable group of seme-inorganic compounds which link the organic and inorganic materials. Several of these silicone compounds are resins resembling organic varnish resins in their physical characteristics. The molecule of the silicone resins has an inorganic structure, a silicon-oxygen chain, so that the resins have tremendously greater thermal endurance than the best of the conventional organic resins. Many combinations of molecular structures are possible with these silicone materials, and they may serve numerous purposes. For example, they are used as insulating varnishes, insulating resins, lubricating greases, filling compounds and fluids for various applications.

Silicone varnishes are available in forms similar to those with which the industrial motor user is familiar. Some silicone varnishes are made with organic solvents; others are of the solventless type. They are used to impregnate and dipcoat coils, insulation, and wound equipment by processes similar to those in which organic varnishes are used. Silicone varnishes normally require higher baking temperatures than do organic materials, usually 225° to 275° Centigrade. For this reason, it is essential that a very minimum of organic material be contained in the insulation at the time of the high temperature bake. Therefore, organic resins must not be used in the manufacture of composite insulation to be used in conjunction with silicone varnishes.

Table I—Available Forms of Silicone Resin Insulation

Item	*Size*	*Use*
Silicone Varnished Glass Cloth	Continuous Rolls 18 in. Wide. .004 and .017 in. Thick	Backing or Composite
Silicone-Glass-Mica Wrapper	Sheets 18 in. x 36 in. .008 in. and .010 in. Thick	Coil Wrapping
Silicone-Glass-Mica Glass Material	Sheets 18 in. x 36 in. x .023 in.	Slot Cell Liners
Silicone-Glass-Mica Wrapper	Sheets 18 in. x 36 in. x .015 in.	Phase Insulation in Stators
Silicone Varnished Glass Covered Wire	All Standard Sizes	Magnet and Stator Winding
Silicone Filling Cement		Plastic Filling Cement Not Rigid
Silicone Bonded Glass-Mica Tape	All Standard Widths Thickness—.0055 in. and .0075 in.	Ground Insulation for Coils
Silicone Sized Glass Tape	Widths up to 1 in. Thickness up to .015 in.	Protective outer Wrapping for Coils
Silicone Sized Asbestos Cloth	Sheets 36 in. x 36 in. x .035 in.	Cushioning Material

If the design engineer is to attain the maximum utility of the thermal endurance of the silicone resins, both surface and sub-surface insulation must be thermally stable and moisture-proof. A complete line of insulating materials incorporating silicone resins with various inorganic base substances such as mica, glass, and asbestos has been developed, with limited availability. These materials are available in the same forms as the more familiar Class B materials and a list of them is shown in Table I.

Small induction motor stators have been wound with silicone bonded glass-mica slot cells; with silicone varnished glass-covered wire for the coils; and with silicone bonded glass-mica phase insulation. The completed stator was then vacuum impregnated in the high-temperature silicone varnish to furnish the waterproof external coating.

The field coils of small direct current motors have been wound with glass covered silicone treated wire and given a vacuum impregnation and two dips before being placed on the pole pieces. These same materials were used in the armatures, but baking temperatures were lowered to 200°C. because the solders now available are likely to flow at 250°C. Still other silicone materials have been used in larger machines where pre-insulated and formed coils are used. For example: Silicone bonded glass-mica tape has been used for ground insulation; silicone sized glass tape has been used for the outer protective wrapping; coils have been impregnated with silicone varnish; and the completed armature or field given a final dip and bake in silicone varnish.

The superiority of silicone varnished glass cloth as compared with a Standard Class B varnished cloth after twenty-four hours at 250°C. has been demonstrated. The silicone treated cloth retains its original flexibility; whereas the Class B material is severely darkened and embrittled in addition to losing its desirable electrical properties after only two hours.

Further measurement of the behavior of silicone films on aging shows that in the range from 200°C. the silicone resins rather closely follow the "Ten Degree rule"; that is, that the life of the resin doubles for each 10°C. drop in temperature. Table II, illustrates this rule.

Silicone insulating materials offer somewhat more resistance to moisture than the conventional materials which use organic varnishes. Stripped films were used in the test for determining moisture permeability by clamping them as membranes over the open mouth of Payne permeability cups and measuring the weight

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loss under a controlled temperature and in a dry atmosphere. Data obtained shows that no more water seeps through the unaged films than through the better waterproofing insulating varnishes or soft vulcanized rubber. After aging for thirty days at 200°C. the silicone film has shown a consistent trend toward improvement, whereas organic films cannot be depended upon as they may or may not improve. Tests on complete equipment confirm these findings. On equipment given moisture and thermal cycling tests, the resistance to moisture has improved with time.

Some low viscosity silicone fluids of the lubricant type make excellent water repellents. These fluids prevent water from forming a continuous film on a surface treated therewith. It has even been suggested that paper raincoats could be made; and fishermen regard the fluid as excellent for floating dry flies in fast water.

One very interesting vibration and thermal cycling test was conducted on a group of silicone-insulated and Class B insulated coils. Various methods of insulating were incorporated. Coils tested used materials such as mica tape, glass and asbestos wire covering with various types of mica wrapper, and glass and asbestos finishing tape. One of the groups of coils was made up of silicone treated glass covered wire, silicone bonded glass and mica wrapper, and silicone sized tape with silicone treatment applied to the completed coil. These various coils were placed in a twenty-eight inch diameter d-c motor armature with a twenty-eight inch core length for convenience only. The armature remained static and was vibrated by external means. Severe thermal cycling was obtained by supplying 750 amperes, 420 volts, a-c, 72 times per minute. This load was intermittent and was held for three seconds duration. During this test, temperatures in the order of 230°C. were observed. The tests covered sixteen hours per day for a period of thirty-six days. Examination of the test coils revealed that while some of the Class B insulated coils had not failed, they showed signs of thermal aging and embrittlement of the resins. The silicone coils not only withstood the test satisfactorily, but the insulation was still in excellent condition.

In order that the life of the silicone insulation be at least equivalent to that now obtained with Class B insulation, it is suggested that the limit for the permissible observable temperature by resistance be set 40°C. above the present Class B limits. This general rule is offered because certain types of equipment have special temperature limits for Class B insulation. It is proposed that the general limit corresponding to A.I.E.E. Standards No. 1 be 175°C. for hot spot temperature. This includes a 5°C. increase in the allowable difference between the observed value and the hot spot temperature.

There are three important ways in which improved thermal endurance properties may be utilized by design and application engineers in the industrial field. They are:

1. A reduction in size and weight of electrical equipment is possible where the operating temperature can be increased and where no reduction in insulation life can be tolerated.
2. Increased service-life of the insulation can be obtained where it is desirable to maintain conventional size, weight, and temperature limits.
3. Operation in ambient temperatures above the permissible limits for conventional types of insulation can be maintained.

All of the applications to which silicone resins and composite insulation have been introduced is beyond the scope of this article. However, here are a few typical examples of their use in various equipment at the present time:

Table II—Failure Time (Hours) of Silicone Insulation

Aging Temperature Degrees C	*Elongation of Test Sample*				*Crase Failure Time*
	14.4%	7.2%	3.6%	1.8%	
250	36	55	63	80	85
225*	225	290	375	500	590
225**	205	314	360	456	485
200*	1060	1630	——	——	——
200**	1160	1790	——	——	——

* Actual
** Calculated by 10-degree Rule

1. Totally-enclosed Fan-cooled Induction Motors.

(a) Early in 1942 a totally-enclosed fan-cooled induction motor stator was wound for 10 hp using the best available Class B insulating materials. This stator was given a vacuum impregnation and two dips in silicone resin varnish. The motor was normally rated 3 hp with Class A insulation and 5 hp with Class B. A series of engineering tests, including overload temperature runs, were made. The overload runs included a thirteen hour test at 300°C. total operating temperature, and a peak overload test during which 500°C. total temperature on the winding was observed by thermocouple. These tests were followed by an accelerated life test on the insulation during which the motor winding was operated at 210°C. rise by resistance (250°C. hot-spot temperature) for 3376 hours. The motor was dismantled and examined periodically. The winding was also subjected to a high humidity test. The test was terminated by a bearing failure which resulted in damage to the winding.

(b) A second motor was rated 25 hp at 1750 rpm and was built in a 15 hp frame. The motor was insulated as in (a) above. This motor ran for over 3200 hours at 250°C. hot spot before a mechanical failure of the bearing stopped the test.

(c) A third motor was built the same as (a) above except that silicone materials were used throughout. This motor is still driving an M-G set after completing over 4100 hours at 185°C. hot-spot temperature. The set is shut down frequently so that in all respects the motor receives actual service.

(d) Another example is a 7½ hp motor which drives a caustic pump in a moist atmosphere. This motor operates twenty-four hours a day and is started once a week. It has been in service for over eleven months as against only a little over five months for a Class A insulated motor.

(e) A fifth motor, rated 25 hp, drives an evaporator pump in a wet location. This motor has been in operation for over thirteen months, whereas previous conventionally insulated motors failed in approximately six months.

2. One 250 kva, 440 volt generator was made with silicone insulation throughout the stator. As a preliminary temperature test, the stator was short-circuited at 275 per cent normal current. This load resulted in an observed temperature of 355°C. which was held for six hours. Subsequently, the stator was redipped and baked and then subjected to an accelerated thermal aging test. The test consisted of heating the stator on alternate days by loading the unit as a generator. The observed rise by resistance was 210°C. (250°C. hot spot). At the end of 2966 hours the test was terminated even though the insulation was still in satisfactory condition.

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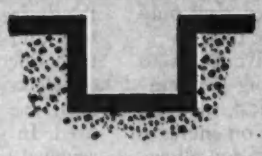
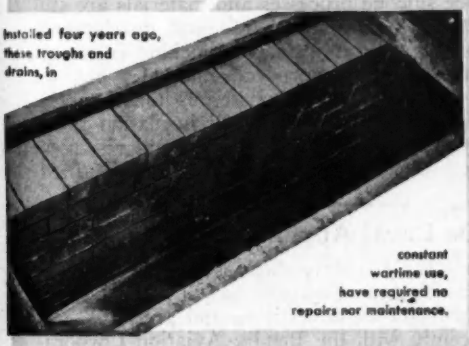


DRAIN OR TANK LINING

PROTECTION FOR SUPPORTS



Installed four years ago, these troughs and drains, in constant wartime use, have required no repairs nor maintenance.

PROPERTIES

Chemical Resistance — Inert to: Alkalis, fats, oils, solvents, fresh or salt water, steam, all mineral acids including hydrofluoric acid, with exception of high concentrations of strong oxidizing acids such as nitric, chromic and many organic acids, and alternate contact with strong acid and alkali.

Attacked by strong oxidizing agents.

Color	Black
Permissible temp. in use	Up to 375° F.
Absorption (ASTM)	Less than 0.5%
Compressive strength	12,000-14,000 lbs. per sq. in.
Tensile strength	1,000-2,000 lbs. per sq. in.
Modulus of rupture	1,800-2,100 lbs. sq. in.
Coefficient of thermal expansion	.0000087 inches/inch/degree F. (in range 80-350° F.)
Porosity	Completely impermeable, even at elevated temperatures. It is non-porous.
Joint thickness recommended	⅛-¼ inch
Mortar required to butter one 9 inch brick on 3 sides	½ lb. (approximately)
Storage	Can be stored indefinitely in a cool place.
Hardening time	Pennsalt PRF Cement construction may be placed in service within twenty-four hours.

Containers (Non-returnable)	POWDER	SOLUTION
	20 lb. drum	10 lb. drum
	100 " "	50 " "
	250 " "	375 " "

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PENNSYLVANIA SALT MANUFACTURING COMPANY

Chemicals

1000 Widener Building, Philadelphia 7, Pa.

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3. A few mining locomotive motors, street railway motors, and trolley coach motors have been made with silicone materials and are now being tested in the field. Some have already given service far beyond that obtained with conventional materials.

4. Magnet coils for relays and contactors, and several hundred dry type transformers have been insulated with silicone materials and placed in service.

The foregoing applications are typical of the ways in which the high thermal endurance properties of silicone resins and materials can be applied to industrial equipment. Table III suggests others. It will be noted that some applications overlap. Also, that some applications must be carefully studied to insure proper results. For instance, on machine tool motors care must be exercised to insure that the higher temperatures involved will not affect the accuracy of machining. Another precaution to be taken is one of keeping the bearing temperatures at safe operating temperatures. The safe temperature for grease lubricated bearings is 110°C. total temperature if the proper lubricant is used. It may be necessary to provide cooling for the bearings on some machines applied in a high ambient.

It must not be assumed that silicone insulation is a "cure-all" for motor ills. While an excellent insulating material, it must be applied with extreme care if maximum utilization of its properties is to be realized. As more and more equipment becomes available for handling the manufacturing processes, then, and only then, can there be extensive use of silicone motors.

To completely evaluate the possible advantages to be realized by using the increased operating temperature silicone offers, certain characteristics must be considered. The following study is based on increasing temperature only, the speeds and insulation allowances being conventional. It should be remembered that other problems are introduced, particularly mechanical problems as previously mentioned. Obviously, these problems can be solved only by experience on specific applications. Other considerations relate to performance—efficiency and power factor. In other words, it should be recognized that the major advantages derived from silicone insulation are accomplished only through a balanced design:

1. Small industrial motors: Most designs in commercial production are Class A, 40°C. rise machines. Some weight reduction would be possible on certain designs in going to 50°C. rise without change in insulation. Further weight reductions would be possible on some of these by using conventional Class B insulation. On some motors, such as the open and splash-proof types, the torques, efficiency, and power factor requirements limit the advantages to be gained by use of the high-temperature insulation. On some totally enclosed fan-cooled motors the same factors may well apply. However, there may be more possibilities in redesign for weight reduction because the operating temperature, frequently the limit in design, has been increased.

2. Large synchronous and induction motors: The larger machines and higher speed machines could in some cases be reduced in weight by utilizing fully the present Class B temperature limits. In addition, there are some of those larger or higher speed designs which could be made still smaller, if an increase of 40°C. were possible above present Class B limits. In most cases, the maximum possible gain in size and weight reduction through increase in permissible temperature will require some sacrifice in efficiency, and power factor on induction machines.

3. Large Direct-current machines: The effect of temperature on size and rating of this class of equipment depends upon the design characteristics, particularly on the ratio of copper loss to iron loss. Their design is standardized through establishment of lines of frame sizes to fit widely varying conditions. This naturally results in some machines being larger and heavier than those specifically made to suit a particular application.

As fibrous glass was introduced to various industries, new hopes were held for higher operating temperatures, but suitable treating materials were not available. Now, with silicone resins indicating that the desired results can be achieved, both in the laboratory and in the field, extensive use of high temperature silicone insulation can be expected. Many types of electrical machines are larger and heavier than need be if high-temperature silicone insulation is used. In some instances it may be desirable to supply renewal parts treated with silicone for existing equipment which has a short life or requires increased power. Since silicone processes and materials are still relatively new and require additional development the cost of the silicon insulated machine is necessarily higher than the more conventional types. In any event, the new silicone materials must not be considered as the "cure-all" for all insulation problems, but must be applied with caution and vision on specific applications where their use can be justified.

De Laval Appoints Flagler

TRENTON, N. J., November 26, 1945—The De Laval Steam Turbine Company has appointed Palen Flagler as director of advertising and publicity. Mr. Flagler, recently with the Bendix Aviation Corporation, Philadelphia Division, will make his headquarters in Trenton, N. J. The Geo. H. Gibson Company, New York City, continues to handle the advertising account.

Table III—Suggested Applications for Silicone Insulated Motors

Reduced Wt/hp by Operating At Higher Temperature with No Sacrifice in Life	*Increased Life of Insulation While Maintaining Conventional Size, Weight, and Temperature Rise*	*Operation in High Ambient Temperatures*
Rapid Reversing Motors	Loaders Drills, Shuttle Cars, Coal Cutter Motors, Etc., in Mining Applications	Furnace Motors
Fan-cooled Motors	Motors for Creamery Applications Where Humidity is High	Roll Table Motors
Variable Voltage Drives Where Ventilating is Reduced at Low Speeds with Normal Current in Windings	Motors Handling Fluctuating Loads with High Peaks	Ventilating Fans
Machine Tool Motors Where Space is Limited	Motors Operating in Caustic and Acid Fumes	Circulating Fans Handling Hot Gases
Submarine Propulsion Motors	Pickling, cleaning and plating lines	Dry Kiln Motors
Marine Motors Where Saving in Weight and Space Are Important	Motors used in tropical locations with high humidity	Copper Mining Application Such as Scraper Hoists
Some Hoist Applications		Cooling Tower Motors (High Humidity and Ambient)
Crane Motors		Open Hearth Department
Wood working where motors are shell type or built-in		Bessemer Converters. Forced draft blowers in marine boiler rooms
Short-time rated motors with extremely limited weight and space conditions		Boiler room auxiliaries on shipboard. That is, oil burner motors, oil pump motors, etc.

THE COST OF PAPERMAKING

THE COST of papermaking can be reduced substantially when mill operations are studied with the end in view of reclaiming otherwise waste products or modifying existing facilities to perform additional service.

Foster Wheeler engineers have pioneered in the design and construction of equipment for pulp manufacturers. In a typical instance,* a saving of $40,800 per 340 day year resulted.

Engineering design for pulp manufacturers aims at lowering the cost of operations. Units listed below have lowered these costs and increased efficiency in actual service.

- Turpentine Recovery Systems
- Indirect Digester Heating Systems
- Digester Blow Heat Recovery Units
- Systems for the concentration of spent sulfite liquor to marketable products
- Waste Heat Boilers

*Digester blow heat recovery system in use at a southern sulfate mill. The installation paid for itself in less than 8 months.

FOSTER WHEELER CORPORATION • 165 BROADWAY, NEW YORK 6, N. Y.

FOSTER WHEELER

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
W. L. Cook, Editor

PAPER SITUATION FAVORABLE

Improvement in the over-all supply of paper and paper products continues at a gradual rate. A well supplied paper market which will about balance demand, is not expected in informed quarters in the industry until near the close of the first 1946 quarter, and not until later if workers are slow in returning to the mills and woods and if strikes occur to prolong economic recovery. Production of all types of paper for the nine months of 1945, aggregated 12,928,000 tons, compared with 12,888,000 tons in 1944, which was an increase of 0.3%. In this period total paper output was 6,206,000 tons, compared with 6,149,000 tons in 1944, an increase of 0.9%; paperboard totaled 6,739,000 tons, compared with 6,722,000 tons in 1944, an increase of 0.2%.

The largest increases in paper were in special industrial papers, up 6.1%; in groundwood papers, up 5.3%; in fine papers, up 1.6%, and in sanitary papers, up 1.2%. Production of all other major types of papers were lower, the largest decrease being in book papers, off 6.4%. In paperboard, nine month's output of folding boxboard increased 5.9%; building board, 3.1%, and cardboard, 0.2%. Production of all other major types of paperboard were lower, the largest declines being in tube stock, off 10.2%, and in miscellaneous types, off 8.8%; while containerboard output was 1.9% lower.

In commenting on the general over-all industrial and paper situation, the Pulp and Paper Unit of the Bureau of Foreign and Domestic Commerce, in its latest report stated: When the Civilian Production Administration began operations on November 3, it continued the policy of industry-Government cooperation which proved so valuable during the war. John D. Small, Administrator, stated that industry advisory committees would be consulted before any action is taken which will materially affect production or distribution in their representative industries. Many of the problems encountered by industry during the war are no longer pertinent. Therefore, the Civilian Production Administration plans to retain certain of the 780 key committees which served the Office of Production Management and WPB during the war years. Some of these groups were selected on the basis of their over-all importance in the civilian economy; others because of the difficulties which either exist or which may be encountered by their industries during the reconversion period. Additional committees may be formed whenever required, to discuss and take steps to remedy whatever situations confront industry during the reconversion period.

In reference to the future activity of advisory committees, the report stated that, future industry advisory committee meetings will be held less frequently than during the war and will be convened only when the Civilian Production Administration has highly important matters to consider or when a meeting is requested by three or more IAC members who furnish a proposed agenda to CPA. The following committees in the paper and printing divisions have been retained: Eastern Pulpwood; West Coast Pulpwood, Over-All Paper; Pulp and Paper Industry Chlorine, and Pulp, Paper and Paperboard Industry Transportation. In the printing and publishing division: Book Publishing and Manufacturing; Commercial Printing; Magazine and Periodical, and Newspaper.

The report further stated that, to permit their equitable distribution during reconversion, containerboard as defined in order M-290, and waste paper, were placed under the preference rating system by WPB on October 22, through an amendment to PR-3. Previously, preference ratings did not apply to these products, since they were under other types of WPB control. This action permits anyone who qualifies under the priorities' assistance regulation, PR-28, to apply to WPB for a rating to obtain either of these products. Every order bearing a preference rating must be accepted and filled regardless of existing contracts and orders, except in certain cases specified in Priorities Regulation 1. The amendment removed containerboard and waste paper from List A, to which ratings do not apply. To clarify the effect of the amendment, WPB emphasized that the removal of these products from List A does not affect the normal buyer-customer relationship existing at the present time and does not mean that a preference rating is now required to obtain any of the affected products. The action merely makes possible the assignment of preference ratings in special cases where the products could not be obtained for reconversion purposes on an unrated basis in accordance with the terms of Priorities Regulation 28.

Commenting on the current labor situation in the paper industry, the reports stated in part that, mills report continued difficulties in obtaining additional workers so as to maintain production and ease off from the wartime longer hours per employee. Also, the long existing problem of recruiting workers for pulpwood operations remains a vital consideration in the maintenance of pulp and paper output. The work stoppage by wire weavers which started on October 16 could prove to be disastrous to the paper industry. Most mills have wire inventories sufficient for 30 to 90 days. Pulpwood deliveries through September and October are reported to be reasonably satisfactory, but with signs of a falling off especially in the southern area. Between now and early next year southern mills will have to recruit woods workers to replace the prisoners of war now working on pulpwood cutting.

Hoosier Demand Exceeds Supply

INDIANAPOLIS, Ind., November 26, 1945—Demand for paper and paper products during the last week continued to exceed available supplies and the trade will go into the holiday season with lower inventories than in years. Faced with a backlog of orders which can not be filled, there is little probability that the holiday demand can be met in full. The one-day vacation last week has little effect on the demand.

Advance orders for wrapping paper and bags against the holiday season have been very heavy. Fancy paper boxes and wrappings to express Christmas cheer are scarce and likely will become more so as the season advances. It is generally believed here that no improvement will be seen in the bag and wrapping paper situation until early next year, if then.

Manufacturers in this territory continue to bemoan the lack of adequate labor. Skilled labor in the paper industry is exceptionally scarce, followed closely by the lack of common labor. Young men being discharged from the armed services have, as a whole, been loath to take work in the paper industry and according to some executives, where placements have been made, there has been considerable dissatisfaction. The opinion here is that these young men, most of whom never have had jobs except in the army are finding it very difficult to adjust themselves to civilian pursuits. The discharged soldier seems to have expected more net return from his labor than is possible.

Newsprint demand was heavy last week and will continue so until after the holiday season and year-end sales. Some publications now are placing some foreign advertising that had been refused for months.

Tissues and waxed papers were in good demand. Building paper and roofing demand decreased somewhat during the week with the coming of severe weather.

No change was seen in the waste paper or rag markets. Both were in heavy demand with prices at ceiling levels.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
Oct. 13	96.2	Oct. 14	92.9
Oct. 20	96.5	Oct. 21	90.7
Oct. 27	95.8	Oct. 28	91.3
Nov. 3	97.5	Nov. 4	93.0
Nov. 10	97.0	Nov. 11	91.3
Nov. 17	96.4	Nov. 18	90.3

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	90.6	92.4	88.1
1945	86.7	89.4	90.2	88.1	89.8	91.2	80.8	88.6	90.2	95.9			

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to date	71.3	82.3	86.1	96.8	91.7	88.4	88.5	89.4
Year Average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

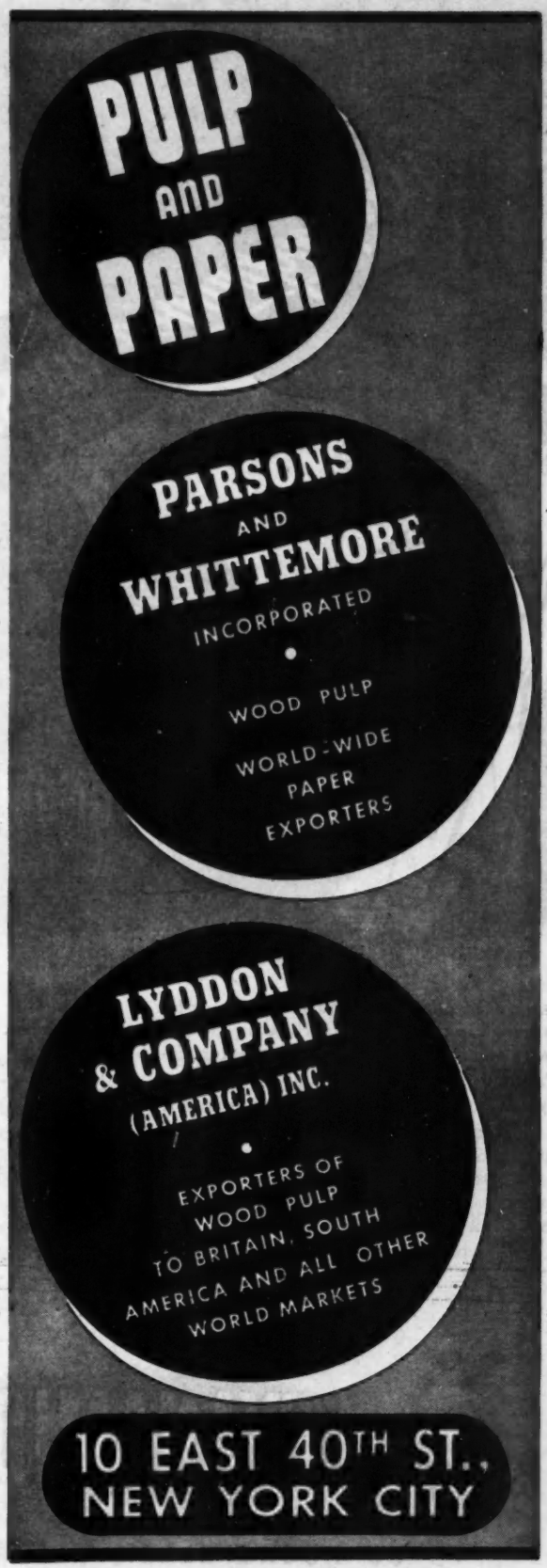
* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

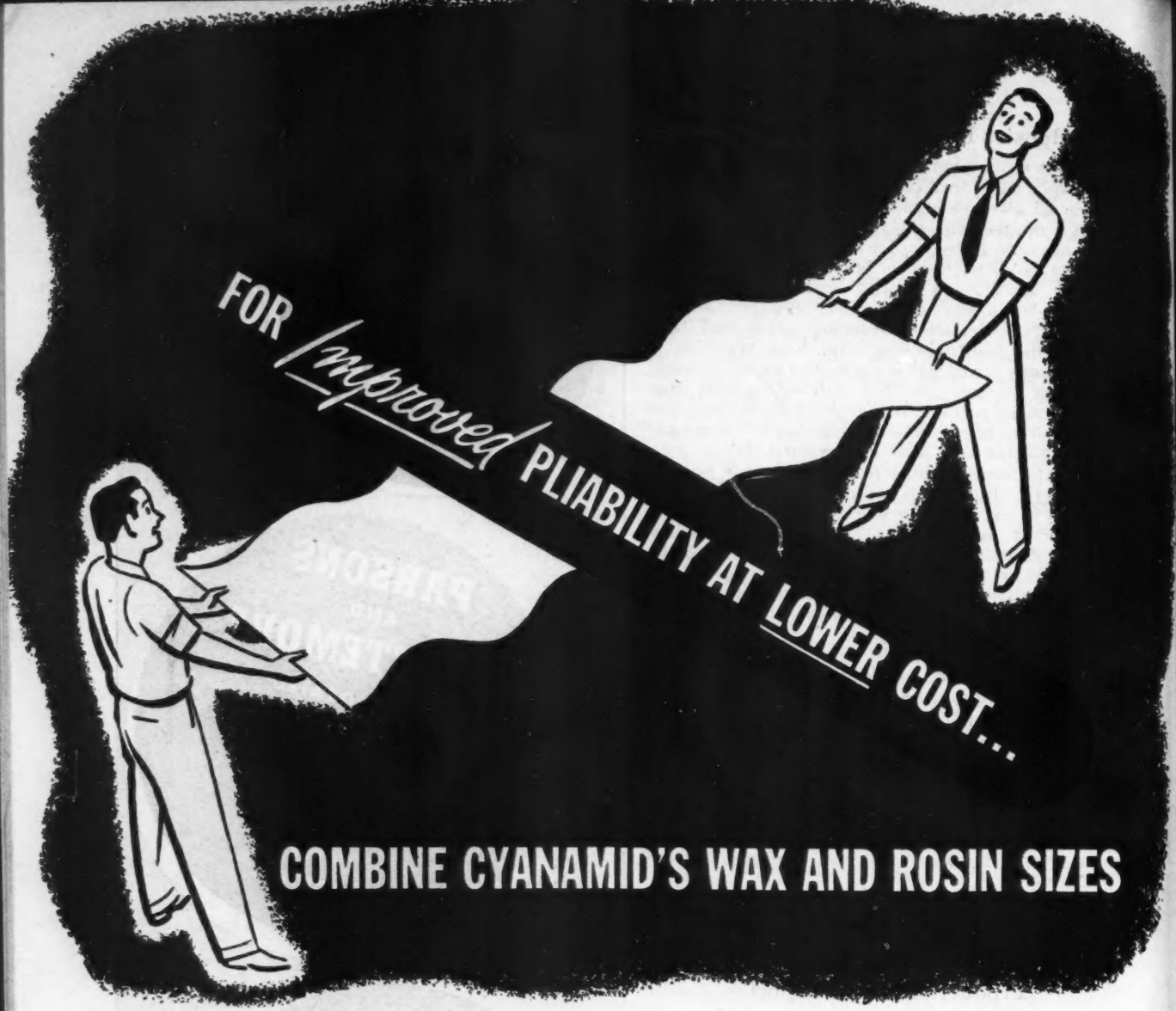
PAPERBOARD OPERATING RATIOS†

Current Weeks—1945		Corresponding Weeks—1944	
Oct. 13	97	Oct. 14	96
Oct. 20	96	Oct. 21	94
Oct. 27	98	Oct. 28	95
Nov. 3	97	Nov. 4	96
Nov. 10	97	Nov. 11	96
Nov. 17	95	Nov. 18	96

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	91	95	97	97	96	96	86	90	91	97			

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.





Improved pliability characteristics may be attained in paper and paperboard products with an accompanying improvement in sizing and probable lower costs through use of Cyanamid's wax size. And here is why...

1. Wax sizes reduce the tendencies of paper to crack and break as a result of loss in moisture content—an especially important advantage in cold weather when indoor humidities are often low.

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Alum, Sulphonated Oils
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Acids, Clays, Satin White
AEROSOL® Wetting Agents
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Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Control of Bacteria and Fungi in Paper Mills

By Leo J. Rampel[1]

Abstract

A general summary is given on the theories concerned with the formation of slime. Of the agents used in its control, chlorine, chlorine and ammonia, chlorine and chloramine, copper sulphate, chlorophenates, and various compounds containing mercury are mentioned. Advantages are claimed for a new material containing mercury.

During the early years of the paper industry when fresh water was employed for all processes, slime was only an infrequent and not too extensive difficulty that had to be combatted. In the majority of cases, the use of chlorinated fresh water was sufficient to control any slime that occurred. However, with the gradual closing of white water systems, a mere chlorination of fresh water was insufficient to control slime formation that was aggravated by concentration and incubating conditions in the system. Because slime today costs the paper industry thousands of dollars worth of paper, labor, and materials, it is a problem that is demanding the immediate attention of most people connected with paper mills.

Types of Slime

The origin of slime is generally conceded to be mainly water, as Beckwith *(2)* and many others in experiments have indicated. However, the use of sterile water or water of low bacterial count in no way guarantees the absence of slime. Air, pulp, broke, starch, and finishing solutions contribute to its formation. One mill in particular has had an extremely difficult time with slime even though it was using water with a 0 to 50 bacterial count.

Pulp, after mechanical or chemical reduction and sterilization, may be relatively bacterial-free. After this process, however, in some cases it remains in storage rooms for 5 days to 5 months, during which time warmth and 10 to 20% humidity induce definite bacterial growth. The colonies of bacteria resulting from these incubating conditions are added to the beater and subsequently carried throughout the whole system. A minor amount of bacteria, given food and proper conditions for absorption and assimilation, may in a short time become a sluggish difficult mass.

The theory is advanced that even felts by contributing a fraction of a quantity of microorganisms formed under the propitious conditions found on felts, may contaminate the white water system which acts almost as nutrient agar to produce myriads from a few.

Air-borne microorganisms also contribute to the slime body as do those contained in sizings and other finishing solutions. Thus, in an effective program, the more nearly one approaches bacteriostatic and fungistatic conditions in all brackets of the system, the more nearly one approaches real slime control.

In any study of this control, it is of course necessary to examine the constituents of slime in order to obtain a comprehensive understanding for effective eradication.

There is not a paper man who does not recognize slime and its appearance. But its constitution is variable. Some like Fritz *(1)* believe that it usually consists for the most part of "filamentous fungi of the mold type that form a matted tangle in which bacteria, yeasts, algæ, and unicellular animals frequently develop." Others, like Beckwith *(2)*, believe bacteria to be the primary cause of slime, forming a mass in which fungi, algæ, and foreign matter may become entangled. Sanborn *(3)* in his experiments even found protozoa and related forms in slime but no worms.

Whatever be the nucleus, it is universally recognized that slime is a heterogeneous mass of bacteria, fungi, algæ, unicellular animals, and foreign matter that have entered either the water system or the paper mill and developed under favorable conditions. This development has often become so complicated and diverse that the original factor has been overshadowed by secondary causative agents.

The exact composition of this heterogeneous mass varies from mill to mill; however, usually a few common organisms repeatedly occur. These have been briefly described by Martin and Griffin *(4)* and Forrester and Kirby *(5)* as: Filamentous iron bacteria that form in the water supply lines and break away to clog strainers, spot paper, and simultaneously carry infection directly into the system. This type is an entrapping type which tends to enmesh other matter. Another fresh water microorganism is the filamentous fungi growths that, like the iron bacteria, adhere to the lines and break away to infect the system and overtly cause trouble. These develop quite rapidly in the paper mill. Algæ, on the other hand, discussed by Martin and Griffin *(4)*, are grown mostly in the water supply system rather than in the paper mill where in the latter case temperature, pH, and light are not as favorable for their growth as for

[1] Rampel Chemical Co., Mount Vernon, N. Y.

the other types of slime formers. The fourth main type of microorganism is the capsulated bacteria that rapidly grow in the paper mill system to form a conjested gelatinous mass occluding other organisms and particles.

The specific members of these general types vary from mill to mill but as King *(6)* found, the most prevalent are *Aerobacter aerogenes* and the members of that family, *E. coli, B. coli, B. subtilis, B. mycoides, Proteus vulgaris, Achromobater, Sulfurem, Crenothrix, Clodosporium* and several unidentified filamentatious mold types. These thrive under the mill conditions of a pH of 5 to 6. Appling *(11)* selected for his studies *Aerobacter aerogenes* as the most prevalent microorganism. Another one of the commonest is *B. subtilis* found in dust, water, etc. This type is particularly difficult in paper mills because as Dr. Breed *(7)* expressed, this microorganism has enzymes that attack felt fibers. At first, the actual protective sheath of the fiber prevents enzyme attack, but eventually this sheath is broken and the enzymes disintegrate the felt.

Whatever be the origin and nucleus of slime formation, it is usually a problem of high priority in the paper mill. Not only are screens and lines clogged and mal odors formed, but the net result is a paper of poorer texture often characterized by spots, stains, and holes with shiny margins. Thus, not from an academic viewpoint but rather from a practical necessity is slime control of vital interest.

In selecting an effective measure for control of slime in each mill, the following are factors that must be investigated before the adoption of any measure:

1. Inhibiting concentration at which the chemical is effective.
2. Degree of selectivity.
3. Lasting effect.
4. Ease of handling, solubility, color, and odor of the chemical.
5. Toxicity.
6. Absorption of the chemical by the pulp to indicate the residue in the mill effluent.
7. Speed and degree of dilution of mill waste into the stream.

Chlorine as a slime control measure was to a large degree successful before the increased closed white water systems. It was contained in the fresh water and also often added to the white water or at various other points in the system depending on the mill. However, with increased closure of the system, the rapidity of dissipation typifying chlorine's effectiveness precluded its continued use, for the white water tanks became breeding places for microorganisms of all types. To prolong the effectiveness of the chlorine reaction, ammonia was used in conjunction with this chlorine for the first time in 1915 for water purification. Whereas chlorine alone destroys 99% of bacteria in 15 minutes according to Baker *(8)*, the addition of ammonia while inhibiting the efficiency for a period of time extends and prolongs the activity to reach a maximum efficiency in 5 to 6 hours instead of 15 minutes.

Chlorine and ammonia have been introduced at various points in the mill; i.e., the groundwood deckers, sulphite deckers, and paper machine white water as well as in the fresh water machine. Even this, while improving existing conditions, does not completely solve the problems. Both the chlorine and chloramine treatment have certain disadvantages that restrict their universal use in paper mills.

Chlorine and chloramine were tried in a closed system newsprint mill in Canada *(10)*. The use of this combination was satisfactory if a residual of 0.1 p.p.m. free chlorine was maintained. However, in time corrosion and disintegration of parts occurred. The paper machines were brightened and other sections became pitted. Various adjuncts were added to the system but were rejected either because of their ineffectiveness or cost.

Another paper mill using this same chlorine method found it unsatisfactory because of the expense of replacing corroded parts. It was found that corrosion occurred at the intersection of the screens where the parts were welded together. A weekly replacement of approximately $1000 worth of screens was being required. Furthermore, to maintain effective control, breakpoint chlorination was necessary which in this particular mill was too costly.

In certain western mills, the use of chlorine is unsatisfactory because, as King *(6)* found, chlorine reacts with the western groundwood. He found that it combines chemically with lignin to about 30% of the pulp. The use of chlorine is satisfactory where there is a small amount of organic matter present but not when there is a large quantity of pulp. Also, in western groundwood usually a bleaching agent is necessary which reacts chemically with chloramine.

Chlorine and chloramine treatment have been found to have the disadvantage of selective action in slime control. One mill found that although certain forms of slime were eradicated with the use of chloramine, an increase in tapoica slime occurred *(6)*. According to Baker *(8)*, one mill reported that chloramine applied to white water was effective in eliminating slime near the point of application in the white water system but that farther down the line the slime condition increased even more than before chemicals had been used. The theory is advanced that there is a decomposition of the chlorine-ammonia bond resulting in a residual of ammonia which fosters slime and corrosion of equipment. Suydam and McConky *(9)* found colonies of bacteria in the water and on the paper of a chlorinated system, indicating that some microorganisms were evidently resistant to the chlorine treatment. Although chlorine and chloramine are widely and successfully used in many paper mills, there is still the quest for something of more universal effectiveness, less corrosion and greater ease of handling.

Heat, electrolytic introduction of metallic ions, and many chemicals have been tried. As King *(6)* emphasized, heat inhibits bacterial growth when applied to groundwood, but it is carried over to the paper machine where it increases bacterial action. Electrolytic introduction of silver ions is satisfactory for clear water but not for groundwood.

Copper Sulphate

Many different chemicals have been tried but with varying registered success. Copper sulphate is used to a limited extent but even with low concentrations some corrosion occurs *(3)*. King *(6)*, from his studies, reports that a concentration of 150 p.p.m. was required to attain growth inhibition.

Chlorophenates

More recent developments have been in the use of phenol and mercury compounds that have been tried extensively.

Various forms of the chlorophenates have been tested in laboratory and mill application. King *(6)* found that the concentration of sodium penta- and tetra-chlorophenates necessary to prevent bacterial

growth increase was quite high in comparison with that of certain mercury compounds: 100 and 150 p.p.m. for sodium penta-chlorophenate and sodium tetra-chlorophenate, respectively, in comparison with certain mercury compounds that required a concentration of 5 p.p.m. to prevent growth increase. He also found that sodium penta-chlorophenate reacted with the groundwood stock as did most phenolic compounds.

The chlorophenates were applied successfully at a Canadian paper mill and enabled a greater closure of the white water system. However, it was found *(10)* that they tended to be selective in their action, eradicating certain types of slime but simultaneously effecting a reversal of the general slime picture. The mass changed from a rubbery composition to a gelatinous type that was more easily removed by mill washings. That mill in particular found that a combination of penta and tetra-chlorophenates and two chlorophenolphenates eliminated the so-called tapioca slime but was ineffective against the *Oidium* and *Monilia.*

It was found in the above mill that the chlorophenates must be continuously applied and a residual must be maintained throughout the white water and stock systems.

In the above category also belongs chlorinated phenol. Based on an approximate cost of $0.15 per pound, the required inhibition concentration of 225 p.p.m. would necessitate approximately $33.75 worth of chlorophenol chemical per 1 million pounds of water. This inhibiting concentration was determined by Appling *(11)* using the *Aerobacter aerogenes* as the test organism.

Mercury Compounds

The mercury compounds were first used by the mill discussed by King *(6)*. He experimented with various mercury compounds and found that they as a whole required an extremely small concentration for the prevention of microorganism growth increase. Ethyl mercuric chloride and 6% ethyl mercuric phosphate required a concentration of only 5 p.p.m. for inhibition. Ethyl mercuric chloride 4% and ethyl mercuric hydroxide required a concentration of 10 p.p.m. for inhibition. King found the mercury compounds efficient and cheap as well as nonselective in action. The compounds are usually applied in an intermittent flow during a 24 hour period 4 days a week. At certain seasons, the dosage is increased 25 to 50% when the temperature of the water demands more control. This occurs in the spring when the water begins to warm and in the fall before it begins to chill. Appling *(11)* found that a concentration of 10 p.p.m. of the commercial ethyl mercuric phosphate was required against the test organism *Aerobacter aerogenes.* This commercial product sells for approximately $0.48 per pound, thus requiring $4.80 worth of chemicals per 1,000,000 pounds of water, based on Appling's computations for the inhibition concentration of 10 p.p.m.

There is on the market another mercury compound found by Appling *(11)* to require a concentration of only 1 p.p.m. for effective inhibition against the test organism *Aerobacter aerogenes.* The approximate cost of this is $0.70 per ounce which would require $11.20 worth of the commercial product to maintain the required 1 p.p.m. inhibition concentration.

Only recently there has been developed by the writer a new organic compound* a colorless, odorless liquid that not only possesses the seven above mentioned qualifications for mold and slime control but also is extremely practical from the cost angle, comparing favorably with presently used slime controlling chemicals.

This new chemical is a complex organic compound with a small amount of an organic mercurial added. This latter quantity, however, is so small that under the proposed 1 p.p.m. concentration usage recommended, only 1 part of mercury per 50,000,000 parts of water is present. It was found that 1 p.p.m. of this chemical was more effective both on a concentration basis and cost basis than eight leading chemicals normally used for slime control. For continued optimum efficiency, a 2 p.p.m. concentration is advisable.

Following Pearl Harbor, this chemical was introduced to the textile industry as a bacteriostatic agent and an antimildew to replace various phenolic and mercuric salts then used. These salts were both toxic and irritating to the skin. Because of the fact that the compound is neither toxic nor irritating to the skin under conditions of use, it is now being used on many threads, tapes, bindings, piece goods; i.e., in textiles which come in direct contact with the skin.

Because it will inhibit bacterial multiplication, it is recommended that felts in the paper mill be treated with this compound. It is noticed that wherever there is slime a so-called pitch collects on felt. This often causes a greasy spot that shows on the finished paper. On fine paper, such as writing paper, this results in a complete loss. By controlling slime formation and other bacterial multiplication on the felts—in other words, by having felts actively antiseptic—the theory is advanced that not only would the so-called grease spots on the paper be decreased, but the multiplication of slime-forming organisms that inoculate the white water system would be retarded.

Experiments are now being conducted at certain mills on the use of this new chemical for slime control. From early reports, the indications are that it has infinite possibilities in this field because of its effectiveness, prolonged action, ease of handling and nonselectivity.

* The product is sold under several trade names, the most prominent being Perm-Aseptic, Ramplex, Fen Antimildew, Fenaseptic, etc.

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10. Grant, *Pulp Paper Mag. Canada* 43: 89-93 (1942).
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Optical Instruments

The Chemical Publishing Company has recently published "Optical Instruments" by Earl B. Brown (432 pp. 6x9). It covers the basic principles of design and function, as well as adjustment of the various common types of optical instruments. Description, operation and theory of optical instruments such as the telescope, camera, microscope projectors, spectroscope is given. Principles of reflection, refraction, lenses, etc. are discussed with details of construction and maintenance of instruments.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $10.00 per copy.

Soluble Synthetic Salt Cake

By Vernon Woodside[1]

Abstract

The results of a successful mill trial in which synthetic salt cake was added to the dissolving tank of a B & W oscillating spray type furnace are given. Rotary furnaces were utilized to burn that portion of the black liquor which could not be handled by the B & W furnace. Data are presented on the composition of the smelt, green liquor, and white liquor.

A series of tests were made to determine if the use of synthetic salt cake caused increased corrosion. No such effect was noted.

The use of synthetic salt cake for alkali makeup at the green liquor stage in kraft systems was recently described *(1, 2)*. As a result of a plant study, more detailed data are now available with regard to the effect this new procedure has on the composition of the liquor at various points of the system.

Conditions of Study

The study was carried out in a kraft mill equipped with a B & W Tomlinson oscillating spray furnace and several old fashioned rotary furnaces. The latter were used to burn that portion of the black liquor which could not be handled by the B & W furnace.

The first 6 days of the study period were used as a control period, plant operations being continued as usual. The customary practice, which was continued during this time, was to add about 60% of the byproduct salt cake and sulphur to the rotary furnaces and the remainder of the salt cake to the B & W. No sulphur was added to the B & W.

This control period was followed by a 15-day test period, during which time the operation of the rotary furnaces continued unchanged,** but synthetic salt cake was dissolved directly into the dissolver tank of the B & W. This was accomplished by running an ordinary 4-inch iron pipe from the salt cake dry feeder to the dissolving tank thus bypassing both the black liquor mixing tank and the furnace.

In an effort to determine the maximum amount of synthetic salt cake which could be fed to the dissolver, the feeder was operated up to its full capacity of 80 pounds per minute or 57.6 tons per day for about 1 day. The synthetic salt cake went into solution with no difficulty. The entire daily salt cake requirements of the mill could have been added in this fashion, had this been desired. For the remainder of the test, the salt cake was added at the usual rate of 40 to 50 pounds per minute.

Analyses were run on the smelt from both the B & W and the rotary furnaces, the green liquor, and the white liquor during both the control and test periods. The dissolving tanks of all the recovery units, including the B & W, were connected by a common pipe line forming a common system for all the green liquor, and the green liquor was pumped continuously from this system. It was therefore impossible to separate the green liquor from the two types of furnaces. But since the operation of the rotary furnaces remained unchanged, differences between the control and test period green and white liquors were obviously caused by the change made in the B & W operation; namely, introduction of synthetic salt cake directly into the green liquor.

Other Changes Studied

In addition to these comparative analyses, changes in pulp quality and operating characteristics were also studied. Owing to lack of technical personnel, this work was confined chiefly to qualitative aspects and general observations. No quantitative liquor balance was attempted.

The liquor burned very well, and the furnace operated very satisfactorily. More "shooting" was observed in the B & W dissolving tank, however, and there was a slightly higher lime consumption. No other adverse mill operating conditions were noted.

No noticeable change was observed in the quality or character of the pulp produced.

Composition of the Smelt

Table I compares the average composition of the smelt during the control and test periods. The tests were made by dissolving a sample of smelt in water and diluting to the approximate total alkali content of the green liquor, then analyzing this resulting green liquor by standard TAPPI methods *(3)*.

TABLE I.—COMPOSITION OF SMELT EXPRESSED IN GRAMS PER LITER

	Smelt from Rotary Furnaces		Smelt from B & W Tomlinson Furnaces	
	Salt Cake Smelted in All Furnaces (*Control Period*)	Synthetic Salt Cake added to B & W Dissolving Tank (*Test Period*)	Salt Cake Smelted in All Furnaces (*Control Period*)	Synthetic Salt Cake added to B & W Dissolving Tank (*Test Period*)
Total alkali*	21.25	21.72	20.05	22.08
Sodium sulphide	42.33	53.09	47.63	27.08
Sodium thiosulphate ..	1.94	2.76	1.00	1.12
Sodium sulphite	1.03	1.38	1.01	1.49
Sodium sulphate	18.81	14.38	5.50	3.83
Sodium carbonate	167.87	158.30	169.81	193.95
Sodium hydroxide	0	0	0	2.50
Sulphur in sulphide ...	17.40	21.81	19.55	11.10
Sulphur as polysulphide**	2.32	1.06	1.74	1.37
Sulphur in thiosulphate	0.78	1.12	0.40	0.45
Sulphur in sulphite....	0.26	0.35	0.26	0.42
Sulphur in sulphate....	4.23	3.23	1.24	0.89
Total sulphur***.....	24.99	27.57	23.19	14.23

* Test expressed as ml. normal acid per 5 ml. sample.
** According to Griffin.
*** By summation.

It will be noted from the first two columns of this table that considerable difference exists between the control and test analyses of the smelt from the rotary units, even though operation of these remained unchanged. It is well known, however, that the samples of smelt from such units will vary to this extent normally, because of the variation in feeding the units, operating the units, and particularly collecting the samples. Therefore, too much emphasis should not be

[1] Member TAPPI; Tech. Rep., Mathieson Alkali Works, Inc., Niagara Falls, N. Y.

** Small amounts of synthetic salt cake were occasionally added to the rotary furnace during the test period because it was more readily available than byproduct salt cake. However, since the synthetic salt cake was smelted, it would have no significant effects on the results of the test period operations in the amounts used.

placed on the differences indicated. It is interesting to note that a summation of the total sulphur in these two columns gives a much closer agreement than is obtained from a comparison of the individual items.

A study of the analyses of smelt from the B & W during the control and test periods bears out the view held by many kraft mill operators that about half the sulphur is lost in the first pass through the furnace. Actually the analyses indicate that a makeup of about 42.2% on the basis of sodium sulphide or about 38.2% on the basis of total sulphur as sulphur, is necessary in this particular case to keep the sulphur in the smelt at a normal balance. This calculation of sulphur makeup is based on smelt analysed as green liquor. It should not be confused with soda makeup since the total alkali is the same in both the control and test periods.

Much more significance may be attached to the comparative figures for the B & W smelt during the control and test periods, because the continuous feeding of materials to this furnace and its more uniform operation give more uniform analyses of its product with less daily fluctuations.

It is interesting to note that addition of synthetic salt cake to the green liquor reduced the sulphate in the B & W smelt by about 31%. This, of course, increased the reduction test as will be noted in subsequent data. The reasons for this reduction in sulphate content are relatively clear. There are normally three ways in which sulphate may occur in the smelt: 1. From unreduced salt cake added directly to the furnace either as burden in the liquor system or as makeup chemical; 2. From reoxidation of sodium sulphide or other sulphur compounds already formed from the added salt cake or black liquor; 3. From oxidation of sulphur compounds returned with the black liquor.

The elimination of salt cake addition to the unit, thereby eliminating about 37% of the sulphur, resulted in a 31% sulphate decrease (or only about 25% calculated as sulphur). There arises, therefore, some interesting speculation as to the source of the unreduced sulphate usually found in the liquor system, namely, to what extent is it due to the salt cake introduced into the furnace or to the reoxidation of the sodium sulphide formed from the organic sulphur compounds in the black liquor.

Composition of the Green Liquor

In studying the composition of the green liquor, it must be borne in mind that it is a composite of the smelt from both the B & W Tomlinson and the rotary units. The differences observed between the control and test periods, in so far as they are significant, are caused by the change in the operation of the B & W furnace; namely, the addition of synthetic salt cake directly to the green liquor. The magnitude of these differences is roughly proportional to the amount of smelt produced by each type of unit or to the amount of green liquor produced by each. Under the circumstances existing at the time of this test, it was impossible to measure these amounts accurately, and the data listed are therefore empirical. It is possible, however, to observe a very significant trend.

TABLE II.—COMPOSITION OF GREEN LIQUOR IN GRAMS PER LITER

	Salt Cake Added to All Furnaces *(Control Period)*	Synthetic Salt Cake Added to B & W Dissolving Tank *(Test Period)*
Total alkali*	22.10	21.09
Sodium sulphide	44.64	35.38
Sodium thiosulphate	3.34	11.07
Sodium sulphite	1.11	0.35
Sodium sulphate	7.91	6.90
Sodium carbonate	136.80	142.01
Sodium hydroxide	26.50	24.99
Sulphur in sulphide	18.35	14.51
Sulphur in polysulphide**	2.13	7.18
Sulphur in thiosulphate	1.35	4.48
Sulphur in sulphite	0.28	0.09
Sulphur in sulphate	1.78	1.55
Total sulphur***	23.89	27.81

* Test shown is ml. normal acid per 5 ml. sample.
** Aecording to Griffin.
*** By summation.

Referring to Table II, it may be noted that the sodium sulphide content of the green liquor during the test period was decreased by about one fifth of its value during the control period, while the polysulphide sulphur was increased by nearly 2½ times. This was to be expected from the nature of the material added.

It will also be observed that the thiosulphate content was increased by about 2⅓. The role of this chemical in pulping wood is not entirely clear at this point although it is hoped that data will be obtained to clarify this.

In the green liquor, the sulphate decreased by an average of about 13% instead of the 30% decrease found in the B & W smelt. Since the B & W contributes roughly about half the green liquor, this analysis corresponds to the data given earlier.

Composition of the White Liquor

Table III indicates the composition of the white liquors produced during the control and test periods. It is interesting to note that the change to synthetic salt cake in the B & W unit, which caused a 20% decrease in green liquor sulphide, results in only an 11.6% decrease in the white liquor sulphide. Appar-

TABLE III.—COMPOSITION OF WHITE LIQUOR AND SULPHUR MAKE-UP TO SYSTEM EXPRESSED AS GRAMS PER LITER

	Salt Cake Added to All Furn. *(Control Period)*	Synthetic Salt Cake Added to B & W Dissolving Tank *(Test Period)*	Plus or Minus Normal	% Plus or Minus Normal
Total alkali*—titration, ml.	22.01	21.17	...	.....
Sodium sulphide	37.46	33.56	...	— 11.6%
Sodium thiosulphate	4.82	11.20	...	+132.0%
Sodium sulphite	1.07	.47	...	— 56.0%
Sodium sulphate	18.95	10.89	...	— 42.5%
Sulphur in sulphide	15.40	13.76	— 1.64	— 10.6%
Sulphur as polysulphide**	1.86	8.40	+ 6.54	+352.0%
Sulphur in thiosulphate	1.95	4.54	+ 2.59	.....
Sulphur in sulphite	0.27	0.11	— 0.16	.....
Sulphur in sulphate	4.26	2.45	— 1.81	.....
Total sulphur***	23.74	29.26	+ 5.52	+ 23.3%
Polysulphide sulphur plus monosulphide sulphur.	17.26	22.16	+ 4.90	+ 28.4%
Sulphidity based on poly- and mono-sulphur, %	24.48	32.80	+ 8.32	.....
Sulphidity shown by regular mill test, %	21.92	20.85	— 1.07	.....
Reduction—mill test, %	78.49	85.23	+ 6.74	.....
Sulphur make-up added Grams per liter white liquor produced				
In salt cake to rotaries.	3.03	4.35	...	.....
Elemental sulphur to rotaries	6.08	5.33	...	.....
Total to rotaries...	9.11	9.68	...	.....
In salt cake to B & W	5.11	6.70	...	.....
Total to system	14.22	16.38	...	+ 15.2%

* ml. normal acid per 5 ml. sample.
** Method according to Griffin (4).
*** By summation.

ently some change in the sulphur compounds occurs during the causticizing operation.

Since it is the white liquor composition which is of major interest, the only purpose of including green liquor data is to indicate the changes in the proportions of sulphur compounds occurring throughout the system.

It may be observed from the white liquor table (Table III) that the total sulphur in grams per liter has increased by 23.3% upon the introduction of synthetic salt cake into the B & W dissolving tank. This may be accounted for, in part, by the fact that the amount of sulphur added per liter of white liquor produced was increased by 15.2%. Allowing for an experimental error of 5% in total quantities measured, there still remains nearly a 4% increase in total sulphur in the green liquor. It may be concluded that the sulphur losses have been reduced, either because the salt cake was no longer added directly to the furnace, or because this process results in less sulphur loss from the black liquor entering the furnace. It is obvious that there is almost a complete absence of furnace loss from the synthetic salt cake when it is added directly to the green liquor, but it is not certain whether this saving is sufficient to account for the entire difference observed.

Further examination of the data in Table III shows that the chief gains in sulphur were in the form of thiosulphate and polysulphide. Since the role of the thiosulphate is unknown at the present time, it may be considered a total loss for cooking although this is not a certainty. On the other hand, earlier data presented *(1)*, as well as the behavior of the test cooking liquor, indicate that the polysulphide may be considered a total gain of sulphur for cooking. The total gain of sulphur in the form of monosulphide and polysulphide amounted to 4.90 grams per liter. Subtracting the increase in thiosulphate, there remains an increase of 2.31 grams per liter of sulphur. This represents an increase of 9.7% of active sulphur calculating on the basis of total sulphur or a gain of 13.4% on the basis of polysulphide plus monosulfide sulphur.

It may also be noted that the unreduced sulphate content of the white liquor was reduced by 42.5%, raising the mill reduction test by 6.74 points.

Based on an acid titration, which includes only the monosulphide, the sulphidity as indicated by the mill test was decreased by 1.07. Considering both the monosulphide and the polysulphide as active, however, the sulphidity was increased by 8.32, or 34% over the normal. This explains the fact that the liquor acted like liquor of high sulphidity. It also indicates why cooking cycles are upset when elemental sulphur is added to the digestor without being taken into account when the sulphidity is calculated.

Corrosion

A series of tests was undertaken to determine whether any greater corrosion difficulties would result from the introduction of synthetic salt cake as described above. Fire box steel test pieces were bolted on the inside of four digestors numbered 1, 3, 7, and 10. Approximately the same number of cooks were made during the control and test periods and the differences noted. On the basis of the tests indicated here (Table IV), it may be concluded that no increase in corrosion is caused by the introduction of synthetic salt cake in the manner described.

TABLE IV.—CORROSION DATA

Control Period				
Salt cake added to all furnaces				
Digester nos.	1	3	7	10
No. cooks made	175	172	174	178
Inches penetration per year	0.0012	0.0004	0.0012	0.0006
Weight lost, %	0.051%	0.018%	0.053%	0.026%
Test Period				
Synthetic salt cake added to B & W dissolving tank				
No. cooks made	173	174	165	176
Inches penetration per year	0.0012	.....	0.0002	0.0010
Weight lost, %	0.051%	.....	0.007%	0.046%

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2. Woodside, Vernon, *Paper Mill News*, December 15, 1944.
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Lecture Course Hears Experts

Graduate Lecture Course on "Pulp and Paper Technology," which is offered this year at the Polytechnic Institute of Brooklyn, had five lecturers during the month of November, 1945. Robert S. Aries, Research Associate at Polytechnic Institute lectured on "Sulphite Pulping" with special emphasis on the recovery of lignin and other chemicals. Allen Schenck, of the Munising Paper Company, lectured on "Wet Strength Paper." Capt. W. H. Aiken, who is conducting a research program sponsored by the Quartermaster Corps at the Polytechnic Institute of Brooklyn, lectured on "Cellulosic and Other Films." Rex Vincent, from the Bulkley Dunton Pulp Company lectured on "Types of Pulp Available for Paper Making." Vance P. Edwardes, of the International Paper Company, lectured on "Operation of a Sulphite Pulp Mill."

These lectures are part of a course given on Thursday evenings at the Polytechnic Institute and cover the whole field of Pulp and Paper Technology. The course is given under the direction of Mr. Aries.

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

Thomas S. Chambers, Manager of Chemical Research and Engineering, A. B. Dick Company, 720 W. Jackson Blvd., Chicago, Illinois, a 1940 graduate of Harvard University.

John N. Franklin, Assistant Technical Superintendent, Bowater's Pulp & Paper Mills Ltd., Corner Brook, Newfoundland, a 1931 graduate of the University of Toronto.

Charles N. Hagar, Jr., Research and Development Laboratory, B-F-D Company, Plattsburg, New York, a 1941 graduate of the University of Michigan.

Eugene O. Hanson, New England Sales Manager, Paper Division, Brown Company, Berlin, New Hampshire.

Vapor Adsorption

The Chemical Publishing Company has issued a book on Vapor Adsorption by Edward Ledoux (400 pp. 6x9). The physical and physico-chemical background of adsorption, the essentials of vapor and heat transfer, and the saturation of air are discussed to help the engineer in a clear understanding and application of adsorption phenomena to industrial projects.

Among the subjects covered are surface tension, wetting, humidity, vapor transfusion, desorption, air conditioning, dehumidification, cooling with water, silica gel, activated alumina, dehydration, methods of moisture removal, condensation, etc.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York 17, N. Y. at $8.50 per copy.

Compression Test of Fiberboard Shipping Containers*

TAPPI Tentative Standard T 804 m-45

This method of test covers procedures for determining the ability of containers to resist external compressive loads applied to the faces of corrugated or solid fiber shipping containers, usually without contents.

Apparatus

1. *Testing Machine.* A compression testing machine of accepted design and capacity. Any other device may be used provided it operates at a constant rate of speed and the weighing mechanism can be checked as to accuracy with dead weights. A calibration curve shall have been made over the entire working range of the machine so as to apply any correction that may be necessary to both the stress and strain readings.

2. *Sealing Equipment.* Suitable facilities, including sealing boards and proper adhesives, for sealing both top and bottom flaps of box specimens. Any other method of sealing the flaps will be satisfactory provided the method followed does not leave anything inside the box which could influence the compression test results.

Test Specimens

At least twelve specimens of the boxes in a lot shall be selected for test. Of the twelve specimens, ten shall be used for the compression test, five in each of the two directions top to bottom and end to end of the specimen, and two for other combined board tests as may be required. Side-to-side tests of specimens should not be made unless agreed upon for special purposes.

Sealing of Flaps

The specimen boxes shall be sealed so as to avoid distortions which may affect their load-bearing ability. The following methods of preparing the test specimen will accomplish this, but any method that will produce the same result may be used.

(a) The specimen boxes shall be sealed as follows: The box blank shall be squared up and each flap in turn bent backward 180° on the score line and then forward 270° to the normal closure position. Starting with either the top or bottom of the box, the short or inner flaps shall be closed first and each of them shall be given a uniform application of a suitable adhesive, such as silicate of soda. Then the long or outer flaps shall be closed onto the glued surface of the inner flaps. The adhesive shall be kept at least 0.5 inch away from the score lines. The closure shall be placed flat on a solid level surface and a flat, rigid board slightly smaller than the closure area placed on the inner surface of the closure, and weight applied to the board by one of the following means: (1) Placing weights on the board; or (2) inserting a screw hook through a slot in the work bench and through the midpoint of the junction of the outer flaps into the board, from which screw hook a weight is suspended; or (3) making a hole in the center of the board through which a carriage bolt is passed down through the junction of the flaps and through a slot in the bench to receive a large wing nut which tightens the board in place, thus transmitting pressure to the glued surface.

(b) When the first closure glue has set sufficiently to allow handling, the boards and weight or bolt shall be removed.

(c) The other face of the specimen box shall be sealed as follows: A board similar in size to that used for the first closure shall be suspended in the opening of the box. A carriage bolt or screw hook shall be placed so that it extends upward through the center of the board. The short or inner flaps shall be flexed first outward and then inward as described in paragraph *(a)*, and then brought to rest on the board, and given a coating of glue. Then the longer or outer flaps shall be flexed outward and inward and brought to rest on the glued surfaces. Pressure shall then be applied to this glued joint by one of the following means: (1) Inverting the box with the screw hook extending through a slot in the work bench and suspending from the hook sufficient weight to insure firm contact; or (2) inverting the box with the bolt extending through a slot and tightening a wing nut to the bolt to exert pressure; or (3) slipping a second board down over the bolt, and tightening the nut to draw the two boards together, thus holding the glued joint while it sets.

(d) When the glue has set, the clamping device shall be released, thus obtaining a completely sealed box without contents, except for the inner sealing board, which falls loose from the flaps and will not offer any support to the box because it is of such a size as to prevent wedging.

Conditioning Boxes for Tests

The sealed boxes shall be conditioned before testing in compliance with TAPPI Standard T 402 m. The conditioning shall be accomplished in the absorption cycle, i.e. by absorption of moisture.

Procedure

Before starting the compression test, the gross weight of the prepared box shall be determined to the nearest pound.

In making a compression test, center the specimen on the bottom platen of the testing machine, so as not to incur eccentric loading. Then lower the top platen until it comes in contact with the specimen and apply an initial pressure of 50 pounds to insure a definite contact between the specimen and the platens.

With this initial load on the specimen, set the

Note: If the specimen is warped or in such condition that the platens do not make contact at all corners under the 50-pound load (which may be ascertained visually or from an inspection of the stress-strain curve), the curve shall be smoothly extrapolated to obtain the effective distance between the platens under a load of 50 pounds, which shall be regarded as zero deformation.

* This method has been approved as a tentative standard by the Container Testing Committee. Criticisms are earnestly requested and should be sent to R. G. Macdonald, Secretary, Technical Association of the Pulp and Paper Industry, 122 East 42nd St., New York 17, N. Y.
The method has been adopted by the American Society for Testing Materials under Designation D 642-43, except that the latter also requires a determination of the moisture content at the time of test.

autographic loading-deformation recorder pen at zero deformation. If the testing machine is not fitted with an autographic recorder, record the test load for every 0.1-inch or ⅛-inch deformation of the container, or draw a graph to provide this information. Apply the load with a continuous motion of the movable head of the testing machine at a speed of 0.5 ± 0.25 inch per minute until maximum load and/or failure have been reached.

Report

The report shall include the following:

(a) Dimensions of container under test; its complete structural specifications; type of fiberboard; description and specification for blocking and cushioning if used; spacing and size of fasteners; method of closing and strapping; and the net and gross weights.

(b) Description of the contents of the container, unless it is tested empty.

(c) A detailed record of the test on each container, including damage to the container and contents, together with any observation which may assist in correctly interpreting the results, or aid in improving the design of the container.

(d) A graph or table showing the load-deformation relations for each test.

(e) A statement to the effect that the tests were made in full compliance with this method. If the initial load for zero deformation has exceeded 50 pounds as determined from the stress-strain curve, the actual load applied for zero deformation shall be stated.

(f) A statement as to whether the top platen of the compression tester is jointed (free to tilt from the horizontal) or rigid (restrained from tilting).

Pumps Discussed at Fulton Meeting

On Wednesday, November 14th, the Syracuse-Fulton Group of the TAPPI Empire State Section met with the local representatives of the American Pulp and Paper Mill Superintendents' Association to hear a talk "Centrifugal Pumps for the Pulp and Paper Industry" by William Pfarrer, chief engineer of the Morris Machine Works, Baldwinsville, N. Y.

Mr. Pfarrer described the design features of centrifugal pumps for handling paper stock and covered the subjects of pump maintenance and operating problems and their solutions.

The chairman of the local TAPPI section described a cooperative plan between TAPPI and the Superintendents' Association to hold monthly meetings on the fourth Wednesday of each month throughout the 1945-46 season, alternately sponsored by the two organizations. A new TAPPI membership plan was described by the local membership committee representative, and the future meeting plans will include a series of talks on the various types of paper manufacture and operating problems existing in this area.

Those present included: Walter I. Harte, C. E. Reynolds, F. G. Sommerville, E. A. Godfrey, R. J. Hackett, H. S. Diefendorf, R. W. Carr, J. M. Turner, A. R. Black, J. V. Francesconi, W. P. Nelson, Fred Yannes, A. J. Cross, W. J. O'Brien, W. S. Otto, C. E. Foster, H. J. Lynch, W. D. Haskell, Earl L. Blakeslee, Edward F. Boyle, W. H. Pfarrer, H. D. Cook, J. D. Kane, R. F. Vokes, Harvey P. Cannon, A. J. Felton, J. W. Couture, John B. Foley, Ivan Lent, John T. Burns, H. G. Cook, J. A. Lum, C. A. Carlson, Carl A. Barton, George B. Nicholson, Charles Parsons, George O. Weinman, L. J. Valmore.

Lake States TAPPI Discusses Starch

The November meeting of the Lake States Section of the Technical Association of the Pulp and Paper Industry was held November 13 at the American Legion Club House in Appleton. Starch was the subject of the evening, with the discussion led by a panel headed by Martin L. Downs of Thilmany Pulp and Paper Co. Other members of the panel were J. E. Killinger of Penick & Ford, J. P. Strasser of Stein Hall & Co., J. P. Casey of A. E. Staley Mfg. Co., and J. M. Newton of the Clinton Co.

The panel members first talked briefly on new developments in the field of starch. This was followed by a lively discussion of such phases as starch-urea formaldehyde resin combinations, waxy type starches, improvements in uniformity and purity of commercial starches, mill equipment for cooking starch at high concentration, and the importance of proper dispersion of the starch.

The attendance was 108. Those attending included: Alan Adrian, Francis J. Allard, Robert P. Anderson, L. R. Ayers, Henry P. Baldwin, Arnold G. Beaman, Peter B. Borlew, Maurice C. Boyer, Martin F. Bretl, James B. Clarke, T. T. Collins, J. H. Compton, Jr., R. C. Crain, Donald R. Cushman, H. P. Dixson, M. L. Downs, Paul Easton, R. T. Elias, C. R. Faulkender, W. J. Foote, L. V. Forman, H. V. Frederick, H. F. Gardner, John P. Gerhauser, Winfred B. Giese, John Graff, Paul B. Hansen, T. A. Howells, Axel Hyttinen, Peter E. Jones, Leif Jorgensen, Ralph M. Kingsburg, A. R. Kjellgren, L. L. Klinger, J. Kryszak, Otto Kuemmerling, G. Latham, Alex Laux, F. R. MacGonagle, N. L. Malcove, Clarence E. Marchant, Hoke Martin, R. C. McKee, Rudolph W. Meyer, R. C. Miller, L. A. Moss, J. M. Newton, James J. Nick, H. A. Norseen, T. A. Pascoe, A. Phillips, Norman Raymaker, Fred W. Sanders, George W. Sawyer, Aug. T. Schmidt, Milton G. Schmitt, E. C. Schuler, G. R. Sears, F. A. Simmonds, J. Smart, R. H. Smith, I. J. Stafford, R. Stillings, J. Strasser, R. Tornangeau, Martin W. Van de Laarschet, Cornelius Van den Boom, R. W. Van Kirk, V. E. Varhus, **Raymond J. Verhinski, E. J. Vickman, E. H. Voigtman, R. J. Watermolen, S. D. Wells, H. B. Wenberg, C. K. M. Winnie, G. M. Wissink.**

TAPPI Notes

Herbert W. Rowe, formerly of the Sefton Can Company, is now technical developments supervisor for the Nekoosa-Edwards Paper Co., Port Edwards, Wis.

The TAPPI Ohio Section will meet at the Hotel Manchester, Middletown, Ohio on December 11th. There will be a panel discussion on the measurement of paper mill effluents.

The Northern New York Group of the TAPPI Empire State Section, will meet at the Hotel Woodruff on Thursday, December 13th. Dinner will be at 7:00. Dr. John C. Dean of the Socony-Vacuum Oil Company, will speak on "The Use of Petroleum Products in the Manufacture and Processing of Paper."

Hugo Klein is now vice-president of Charles Bruning Co., Inc., Palanda Plant, 200 Pleasant Valley Way, West Orange, N. J.

Bror E. Anderson is now in charge of the Filter Products Laboratory, Johnson & Johnson, 4949 West 65th Street, Chicago 38, Ill.

R. H. Clapperton of Fletcher & Son, Ltd., Greenfield, England, manufacturers of cigarette paper, is visiting in the United States.

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New York Paper and Pulp Market Review

Wood Pulp Overseas Receipts Totaled 360,991 Tons To November 1—Book Paper Supply Is Tight—Over-All Burlap Supply Favorable — Board Mills Need More Folded News and Mixed Paper.

Office of the PAPER TRADE JOURNAL,
Wednesday, November 28, 1945.

Improvement in the over-all paper supply situation supports the belief that a very gradual increase in paper is likely to continue through the first 1946 quarter. Previous forecasts and estimates, which did not include the factor of large wage increases and labor unrest, have been revised downward to fit present conditions. In general, the labor situation is definitely unfavorable to speedy reconversion. Reports received this week from many manufacturers' representatives, jobbers, and general paper merchants, reflect less anxiety about future conditions, however, than for current difficulties. Inventories are very low and until they are increased to more normal proportions, to enable suppliers to more efficiently handle the expanding demand for all paper products, paper distribution must continue below normal trade and consumer expectations.

Current reports state that the strike in the tissue and towel departments of the A. P. W. Products Co. has stalled operations for the last two weeks. A more optimistic aspect is seen in the voluntary offers of wage increases now being reported in increasing number by the industry.

Paper production for the week ended November 17 was estimated at 96.4%, compared with 90.3% for 1944, with 91.4% for 1943, with 86.9% for 1942, and with 105.3% for the corresponding week in 1941.

Paperboard production for the week ended November 17 was 96.0%, compared with 96.0% for 1944, with 94.0% for 1943, with 83.0% for 1942, and with 96.0% for the corresponding week in 1941.

Current reports indicate a tighter supply situation in book paper, particularly for magazine manufacture, which is expanding, with some new publications being issued. Total U. S. paper production for the nine months of 1945 was 12,928,000 tons, compared with 12,888,000 tons in 1944, an increase of 0.3%. Book paper output in this period was 1,071,000 tons, compared with 1,078,000 tons in 1944, a decrease of 6.4%.

Wood Pulp

Wood pulp supply continues tight, with no material improvement in inventories, as output is practically being absorbed by current consumption.

Reports this week indicate that the prospect is good for the receipt of more than 100,000 tons of overseas pulp in November and December of this year, which is above former estimates. The cumulate overseas imports through November 1, 1945, aggregated 360,-991 tons.

Rags

Mill buying of new cotton cuttings is reported active at this date. Demand for all grades of unadulterated rags is heavy in a broad market. Prices are strong at ceiling levels.

Old cotton rags continue in heavy demand in the roofing grades. Prices are firm at ceiling levels.

Old Rope and Bagging

Demand for old Manila rope continues far above the limited available supply. Demand for sisal is less active this week, with jute demand and prices steady.

Outlook for burlap is favorable. U. S. stocks during October were 66,633,000 yards, compared with 53,091,000 yards in September, and with 43,265,000 yards in October, 1944. Total stocks at the close of October were 131,829,000 yards, of which 51,691,000 yards was spot, and 51,691,000 in transit. It is reported that India is planned a 48-hour week.

Current reports reflect a better tone in the scrap bagging market. This improvement apparently consists in a larger supply, but not much change in the consumption of old bagging. Prices are unchanged.

Old Waste Paper

Mill demand for waste paper continues heavy. Somewhat less insistent demand is reported in old corrugated at this date. Mill buying of folded news and mixed paper continues heavy. Demand for the higher grades of paper stock is moderately active this week. Prices are strong at ceiling levels.

Orders Cut in Newsprint Stocks

A reduction in inventories of newsprint held by newspaper publishers and other users below previous permissive ceilings was ordered November 26 by the Civilian Production Administration. The cut is to be effected by December 31.

By an amendment to the Newspaper and Newsprint Limitation Order, L-240, the CPA limited publishers in the Northeastern and Central States to no more than a 25 days' supply of print paper on hand or in transit as of December 31. Publishers in Western and Southern States were allowed a 45 days' supply.

Previous permissive inventories were 30 and 50 days, respectively.

Inventories of other newsprint users must be brought down by the end of the year to 28% of the tonnage lawfully used in the fourth quarter of 1945 from a previous premissive amount of 33⅓% of fourth quarter use.

The action was taken to bring deliveries in line with supply and followed a recent warning by the CPA to users to hold down their orders.

NEW ENGLAND WRESTLES WITH RATE

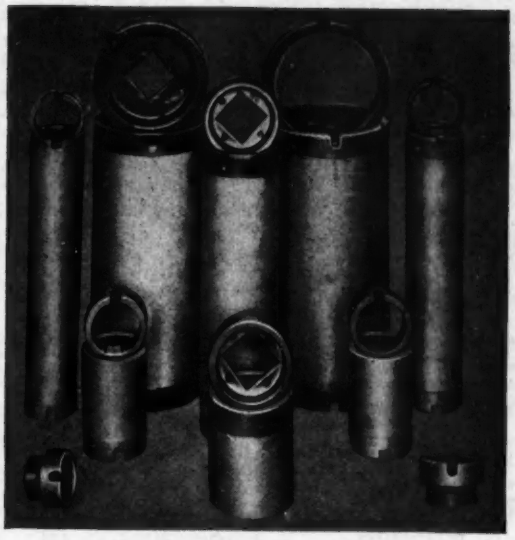
(Continued from page 7)

The end of this strike eases the tension in the paper industry, as many paper mills here faced a shut down soon for lack of wires. Sinclair said that a large backlog of orders has accumulated and there is time to clear this pile off without crippling the paper industry.

Stevens Mills Increase Wages

Three hundred employes of the Stevens Paper Mills, Inc., have received pay increases of about 10 cents an hour, Supt. Raymond J. West of the company said today. The firm operates paper mills in this city and South Hadley.

Pay differentials of four cents an hour for the 3 to 11 shift and six cents an hour for the 11 to 7 were also made, West said. In addition all salaried employes were given a flat 10% increase.



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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, November 28, 1945.

BLANC FIXE—Prices on blanc fixe continue unchanged at prevailing levels. Demand is reported fair. The pulp is quoted at $40 per ton, in barrels, at works. The powder is quoted at $60 per ton, f.o.b. works.

BLEACHING POWDER—All-over demand continues heavy. Production reported high. Backlog orders still large. Quotations are unchanged. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more 24 cents per pound; 2,000 pounds, 24½ cents per pound, less than 2,000 pounds, 24¾ cents per pound f.o.b. shipping point. Imported 24 cents.

CAUSTIC SODA—Demand very heavy. Production large, but under demand. Market tight. Shipments are delayed by lack of manpower. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in drums, car lots, f.o.b. works.

CHINA CLAY—Current demand is reported moderate on many grades of china clay. Quotations unchanged. Domestic filler clay is quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Military and all essential requirements heavy. Output gaining after drop. Supply situation shows some improvement. CPA will retain chlorine advisory committee. Chlorine is currently quoted at $1.75 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—No offerings or sales. The OPA price on "G" gum rosin is $6.74 per 100 pounds in barrels, at Savannah. "FF" rosin is established quoted at $6.70 per 100 pounds, in barrels at New York. Average price on seventy per cent gum rosin size is $6.95 per 100 pounds, f.o.b. works.

SALT CAKE—Prices on salt cake continue to be reported unchanged. Domestic salt cake is currently quoted at $15 per ton, in bulk. Chrome cake is currently quoted at $16 per ton. All quoted prices in car lots, f.o.b. shipping point.

SODA ASH—Heavy demand for soda ash is reported to absorb current production. Market still is tight. Prices continue to conform to prevailing levels. Quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn market is reported steady. Receipts higher this week but far lower than last year. Demand heavy. Prices unchanged on starch. Pearl is quoted at $3.72 per 100 pounds. Powdered starch is quoted at $3.83 per 100 pounds. All prices in bags, car lots, f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand good. Supply situation is favorable. Prices of the commercial grades are currently quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.75 per 100 pounds. All prices in bags, car lots, f.o.b. works.

SULPHUR—Current consumption of sulphur continues heavy. Market situation unchanged. The quotation on annual contracts continues at $16 per long ton, f.o.b. mines. The current price on contracts at Gulf Ports is $17.50 per long ton.

TALC—Demand reported good. Domestic grades are currently quoted at from $16 to $21 per ton at mines. Canadian at $24 per ton. All prices in car lots.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	*$61.00	@	—
Sheets	69.00	@	—
*OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, Delivered			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag	*4.375	"	—
*OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
Boards, per ton—			
News	*50.00	@	—
Chip	*50.00	"	—
Sgl. Mla. Li. Chip	*62.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards	84.00	"	116.00

*OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	32.20 "	37.75	33.35 "	39.25
85% Rag	.... "	....	29.90 "	35.00
75% Rag	23.00 "	27.00	24.15 "	28.25
65% Rag	.... "	....	22.80 "	27.75
50% Rag	18.70 "	22.75	19.90 "	24.25
25% Rag	16.40 "	20.00	17.55 "	21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$10.55	@ $12.75	$11.70	@ $14.25
No. 2	9.65 "	11.75	9.80 "	13.25
No. 3	9.20 "	11.25	9.35 "	12.50
No. 4	8.90 "	10.75	10.05 "	12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$13.50
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	12.25
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.50
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00 @ 83.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	73.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50% 80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25*
Silesias No. 1	—	"	5.75*
New Unbleached	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

*OPA Maximum Prices

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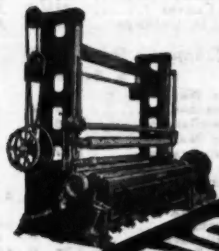

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Old Rags

White, No. 1—			
Repacked	*1.80	"	—
Miscellaneous	*1.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Thirds and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.30	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

Pre-War Quotations
All Prices Nominal

New Rags			
New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25
Old Rags			
No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cottons	4.25	"	4.75
No. 2 White Cottons	3.25	"	3.75
No. 3 White Cottons	2.50	"	3.00
No. 4 White Cottons	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	1.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shoppories	1.30	"	1.45
New Shoppories	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.25	@	3.30
Wool Tares, light	3.25	"	3.50
Wool Tares, heavy	3.50	"	3.75
Bright Bagging	3.25	"	3.50
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Prices.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal
(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—
(Hard Fiber)			
Medium Java	.16	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07½
New White No. 2	.05½
Light Silesias	.05½
Black Silesias, soft	.03½
New Unbleached	.07½
Washable Prints	.04½
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01½
Fancy Percales	.04½
New Black Soft	.03½
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04½
Men's Corduroy	.05½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	1.80	@	—
Miscellaneous No. 1	1.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.50
No. 1 Clean bright—			
Sisal Strings	.04	"	—
No. 2 Clean bright—			
Sisal Strings	.03	"	—
Sisal Jute	.02½	"	.03¼
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.80	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila.)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
No. 1 Mixed Paper	.95	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.87½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.75	@	2.90
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	* —	"	4.00
Mixed Rope	—	"	1.35
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	4.50	"	5.00
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.00	"	3.25
South American	—	"	3.25
Misc.	2.15	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Asst. Wool Pouches	—	"	3.65
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

* OPA Maximum Prices.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	@	.04¾
Fancy Percales	.04¾	"	.05
New White No. 1	.06¾	"	.07
New Light Flannelettes	.05¾	"	.06
Canton Flannels, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¾	"	.06¾
Underwear Cutters, Unbleached	.06¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06¼	"	.06¾
Blue Cheviots	.05¼	"	.06
Fancy	.03½	"	—
Washable	.02½	"	—
Khaki Cuttings	.02½	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¾	"	.03¾
New Canvas	.06¼	"	.06¾
B. V. D. Cuttings	.06¾	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—Repacked	1.80	@	—
Miscellaneous	1.20	"	—
White No. 2—Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.30
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.30	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.30	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

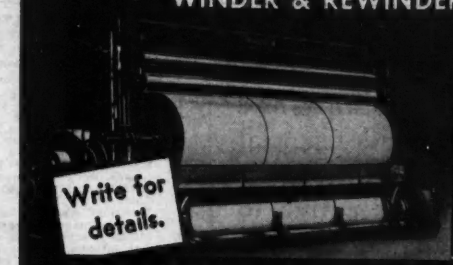
Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Rags	1.45	"	—

SCREENS of Perforated Metal

The Harrington & King Perforating Co.

5652 Fillmore St., Chicago 44, Ill. 114 Liberty St., New York 6, N. Y.

CAMACHINE WINDER & REWINDER 19



WINDS NEWS, BOOK & KRAFT ROLLS FASTER

CAMERON MACHINE COMPANY
61 POPLAR STREET, BROOKLYN 2, N. Y.
MIDWEST OFFICE: 111 W. MONROE ST., CHICAGO 3, ILL.

PENNOTEX OIL CORPORATION

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New York, N. Y.

AMORPHOUS WAXES
Melting Points 120° F. to 205° F.

For the Manufacture of

LAMINATING PAPER . . GLASSINES . . WATER-PROOFING . . GREASE PROOFING . . EXTENDERS FOR PARAFFIN, FOOD CONTAINERS, CONTAINER LININGS, ADHESIVENESS AND PROTECTIVE COATING.

— PAPER MACHINERY —

VICTORY IS ACCLAIMED!

NOW—It is our responsibility to co-operate in the molding of an ENDURING PEACE.

THE SMITH & WINCHESTER
MANUFACTURING COMPANY
SOUTH WINDHAM, CONNECTICUT

Solicit your inquiries for REPAIRS or NEW EQUIPMENT which will receive our prompt attention as rapidly as controlled materials and skilled labor are made available.

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The New Model "E"

Paper Trimmer.

For High-Speed, Dependable
PAPER CONVERTING MACHINES
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POTDEVIN

Paper Bag Machines, Aniline & Oil-Ink Presses, Waxing, Glazing, Varnishing, Laminating Machines.

POTDEVIN MACHINE CO.
EST. 1893
1223 38th ST BROOKLYN, N.Y.

POTDEVIN

The Trade-Mark of
DEPENDABLE FELTS

The Waterbury Felt Co.
SKANEATELES FALLS, N. Y.

K-121-B DEINKING — DECOLORIZING and COOKING PROCESSES K-C-2

THE KINSLEY CHEMICAL COMPANY
12500 Berea Road Cleveland, Ohio

Volclay MOST COLLOIDAL BENTONITE
For the Paper Manufacturer
Produced By
AMERICAN COLLOID COMPANY
363 W. Superior St. — Chicago, Ill.

Appleton Wires are Good wires

APPLETON WIRE WORKS, INC. APPLETON, WIS.

INDUSTRIAL TYCOL OILS-GREASES

A COMPLETE LINE
OF TYCOL LUBRICANTS SCIENTIFICALLY ENGINEERED FOR EVERY INDUSTRIAL USE
Tide Water Associated Oil Co.
Eastern Division
17 Battery Place, New York, N.Y.

HELP WANTED

—PAPER EXPORT—

Important established firm with ample financial facilities has opening for progressive executive to take full charge of Paper Department. Must be experienced all phases paper export. Excellent opportunity. State qualifications and previous experience in strict confidence. Address Box 45-750 care Paper Trade Journal. N-29

MECHANICAL ENGINEER

For development of equipment. Capable of assuming duties of Plant Engineer. Must understand slitting, tension, and other problems involved in production of coated papers. Chicago location. State availability and complete details of experience and education. Address Box 45-753, Paper Trade Journal. N-29

WANTED
ENGINEERING DRAFTSMEN

For design and development of insulation board mill equipment and allied machinery. Permanent position. Experience in design of paper mill equipment helpful but not required. Location South. State availability with complete details of experience.

Address Box 45-726 care Paper Trade Journal. J-3

TOUR BOSS

Wanted for Mill with two small machines. Must be fully experienced in making of Rag and Sulphite Papers in Cover, Blotting and Text Papers. Experience in making of wide range of colored papers essential. Replies treated confidentially. Address Box 45-721 Paper Trade Journal, giving age, experience, family status, etc. N-29

OPPORTUNITY for Paper Chemist for permanent postwar employment by long established manufacturer in suburban Chicago area. Excellent opening for an experienced technician having knowledge of the manufacture of pulp stocks and unsized paper as well as the treatment and impregnation of paper products. Should be able to supervise production processing in small quantities. Address Box 45-738 care Paper Trade Journal. D-6

SALARIED POSITIONS

$2,500-$25,000. Reasonable is creating lifetime opportunities now. This thoroughly organized confidential service of 35 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the caliber indicated. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, INC.
117 Delaware Bldg., Buffalo 2, N. Y. TF

HELP WANTED

CHARLES P. RAYMOND SERVICE INC.
294 Washington St., Boston
Specializing in Paper Mill Personnel

Positions Now Open

Manager folding carton plant, attractive compensation
Designing draftsman paper mill machinery
Chief power engineer $8,000 year to start and substantial increase for competent man
Mechanical and plant engineers, master mechanics, draftsmen and designers
Electrical engineer $4,500-5,000 year to start and opportunity for larger salary if satisfactory
Accountant $4,000-5,000 year
Chief chemist
Technical graduate for control work
Project engineer, Canadian plant, $5,000 year
Master Mechanic and chief engineer $6,000 year
Two cylinder machine mill superintendents, board, tan, solid manila, specialties
Chemist as group leader, pulping and bleaching research
Tour boss
Salesmen for paper mills and firms building paper machinery
Superintendent set-up box and paper board manufacturing plant
Mechanical engineer familiar with slitting tension, and problems involved in production of coated paper, salary $450-550 month
We invite correspondence (strictly confidential) with employers seeking personnel and men seeking new positions. N-29

CLASSIFIED ADVERTISING

HELP WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

SITUATIONS WANTED—5c a word, double rate for heavy face type. Minimum charge $1.25. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—5c a word. Double rate for heavy face type. Minimum charge $1.25.

WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

OPPORTUNITIES—5c a word. Double rate for heavy face type. Minimum charge $1.25.

Classified advertising space may also be purchased at $3.00 per single column inch.

All classified advertisements are payable in advance.

If box number is used—35 cents additional.

Address Replies

to advertisements appearing under Box Numbers in care of

PAPER TRADE JOURNAL
15 West 47th Street
New York 19, N. Y.

HELP WANTED

WANTED — Cost Accountant — Middle West Box Board Mill. Give age, experience and salary expected. Address Box 45-747 care Paper Trade Journal. N-29

WANTED — ENGINEERS — Capable of handling general engineering work in established consulting engineers office specializing in pulp and paper mills. Address Box 45-469 care Paper Trade Journal. 1F

WANTED—One man to represent an Eastern paper converting mill through New York State. We will prefer one who has had some experience in paper sales, and who resides in the vicinity of Syracuse, N. Y. Address Box 45-396 care Paper Trade Journal. D-20

TOUR BOSS wanted to be trained for job of Assistant Superintendent of Rouning Felt Mill located in New Orleans. Send complete resume giving experience, etc. to Box 45-717 care Paper Trade Journal. N-29

FACTORY SUPERINTENDENT for manufacturer of grocery, sacks, specialty bags. Capable taking complete charge. Give full experience and salary. Address Box 45-755 care Paper Trade Journal. N-29

MACHINE DESIGNER preferably with experience on paper mill or paper working machinery for a permanent position. Location Phila. area. Please give complete details, age, experience, etc. Address Box 45-732 care Paper Trade Journal. N-29

BACKTENDERS — FOURDRINIER MACHINES. SEVERAL OPENINGS IN FINE PAPER MILL MAKING RAG AND SULPHITE PAPERS AT SPEEDS UNDER 200 FEET. GIVE COMPLETE DETAILS OF AGE, FAMILY STATUS, EXPERIENCE AND GRADES HANDLED. ADDRESS BOX 45-722 care Paper Trade Journal. N-29

MASTER MECHANIC—One machine kraft mill newly installed 1,000 fpm fourdrinier. To take charge of all mechanical maintenance work. Mill located in Texas. Permanent position. State wage desired, experience, age. All replies confidential. Address Box 45-757 care Paper Trade Journal. D-6

ADJUSTERS—Paper bag manufacturer. Good pay. Give details—experience and salary. Address Box 45-756 care Paper Trade Journal. N-29

OPPORTUNITY—New England Plant has attractive openings for designing draftsmen with experience on pulp and paper mill equipment. Applications invited which would lead to interviews. Address Box 45-765 care Paper Trade Journal. N-29

CHEMIST OR CHEMICAL ENGINEER for mill development work in the manufacture of fine writing and printing papers. Permanent position and excellent opportunity. Give full information including experience and age. Address Box 45-760 care Paper Trade Journal. D-13

SALES ENGINEER with knowledge of Pulp and Paper Machinery and experience in merchandising. Write giving background, references and salary expected. Address Box 45-606 care Paper Trade Journal. 1F

SALES ENGINEER—Age 25-35. Preferably Training pulp and paper industry. Willing travel. Good opportunity—reliable firm. Address Box 45-763 care Paper Trade Journal. N-29

WANTED — EXPERIENCED WELL-TRAINED TECHNICAL MAN TO SUPERVISE RESEARCH AND DEVELOPMENT WORK IN SULPHITE AND SULPHATE PULPING AND BLEACHING IN THE RESEARCH DEPARTMENT OF A LARGE NORTHEASTERN PULP AND PAPER MANUFACTURER. ALL CORRESPONDENCE STRICTLY CONFIDENTIAL. Address Box 45-744 care Paper Trade Journal. N-29

WANTED—Experienced Chemical Engineer to supervise research and development work on fiberboard. Location South. In reply give details of education, experience, salary, availability and photo. Our employees know of this ad. Address Box 45-767 care Paper Trade Journal. D-6

SUPERINTENDENT of Maintenance with paper mill experience, knowledge of power and electricity. Must be college graduate. Give full information including experience and age. Address Box 45-769 care Paper Trade Journal. D-20

miami DV handles 6% stock with ease

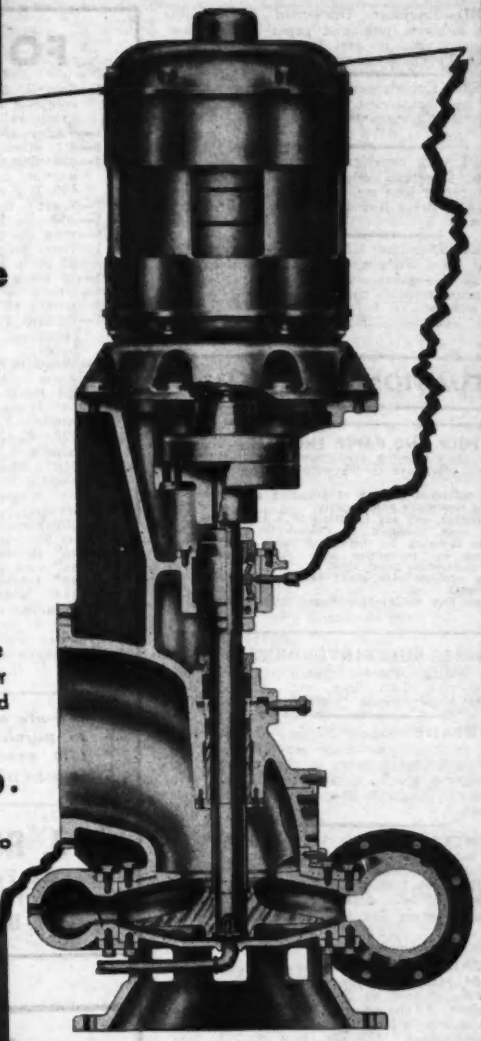
Above is a cut-away view of a pump that has made stock pumping history. Note that suction is at top of impeller which means that any stock from 1% to 6% consistency flows right to the eye of the impeller. This is in direct contrast to bottom suction pumps with their consistency limit of about 3%.

Furthermore, the Miami DV pump is self draining . . . empties itself of the last cupful of stock. Here again, this is in contrast to bottom suction pumps whose design makes impossible complete elimination of stock from bottom well.

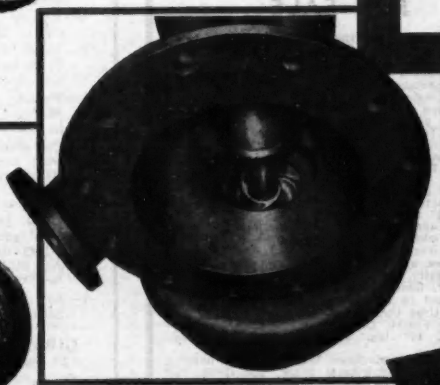
You will want this vertical pump, not only for the above advantages, but because it takes less floor space and is readily accessible for inspection and maintenance. Write for full details.

THE BLACK-CLAWSON CO.
HAMILTON, OHIO

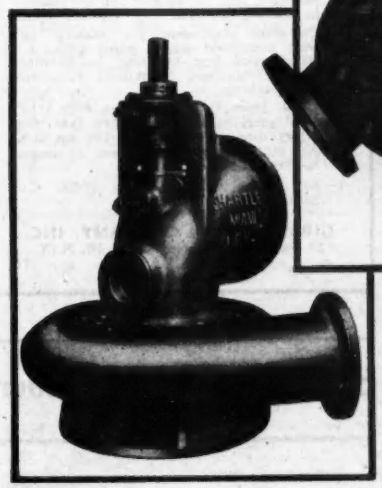
DIVS.: SHARTLE BROS. MACHINE CO., MIDDLETOWN, OHIO
Dilts Machine Works, Fulton, N. Y.



Above is a cut-away view of Miami DV vertical pump.



Note large opening to impeller eye.



Exterior view of Miami DV pump.

HELP WANTED

WANTED—Engineer Draftsman for Pacific Coast sulphate pulp and paper mill. Please give full particulars in first letter. Address Box 45-772 care Paper Trade Journal. D-13

WANTED—Experienced backtenders, windermen and beatermen. State past experience in first letter. Sangamon Paper Mills, Eaton, Indiana. N-29

CHEMIST with experience in waxing and converting. Location midwest. Give qualifications and references in first reply which will be treated confidential. Address Box 45-775 care Paper Trade Journal. N-29

WANTED—Assistant Master Mechanic and Wood Yard Foreman for midwest Pulp and Paper Mill. Excellent opportunity for advancement. Replies treated confidential. Address Replies to Box 45-776 care Paper Trade Journal giving age, experience, family status, etc. N-29

SITUATIONS WANTED

PULP AND PAPER ENGINEER

Many years research development and practical operating experience in the pulp and paper industry.

Have perfected method of reducing production cost and improving pulp quality. Installation will pay for itself in a short time. Have been employed as Consulting Engineer by large company for period of years.

Looking for connection with concern which desires to increase profits.

Prefer medium size plant having sulphate or soda process.

Address Box 45-711 care Paper Trade Journal. D-6

PRACTICAL SUPERINTENDENT on high grade folding boards. Sulphite and ground wood specialties. Test liner, etc. Address Box 45-739 care Paper Trade Journal. D-13

ACCOUNTANT—Expert Paper and Pulp Mill Costs, thorough knowledge paper mill practice gained through twenty years in the industry, desires connection where initiative and ability will be recognized. Address Box 45-748 care Paper Trade Journal. D-6

SUPERINTENDENT—20 years experience in paper bag conversion of grocery, sacks and aniline or oil ink specialty bags. Capable of handling all bag shop problems. Thorough experience in supervision of help, maintenance and repairing of machines. Address Box 45-749 care Paper Trade Journal. D-6

CHEMICAL ENGINEER—University graduate with 24 years of Paper & Pulp Mill experience, desires position as Superintendent or asst. superintendent. At the present time employed with one of the country's leading Asbestos and Roofing Felt manufacturers. Address Box 45-752 care Paper Trade Journal. N-29

PAPER CONVERTING SUPERVISOR. Available, years Supervision, Cutting, Packing, Clerical, various papers. Address Box 45-754 care Paper Trade Journal. D-13

PUMP—Application engineer seeks change of employment. Familiar with sales and selections of all types of pump applications for pulp and paper mills. Excellent record with a leading company in this field for over 10 years. Address Box 45-764 care Paper Trade Journal. D-6

FOR SALE

GOOD EQUIPMENT FOR SALE

34" and 40" Slitters.
41" Hamblet Sheeter.
60" and 110" Mill Type Sheeters.
48" Brown & Carver Auto. Power Cutter.
63" Oswego Hand Clamp Cutter.
52" Two-roll Back-stand, new.
36" Waldron Paper Reel.
36" Waldron 7-color Wall Paper Printing Press.
68" Rice, Barton & Fales Slitter-Rewinder, for use on dry end of paper machine.
14 X 22 John Thomson.
Balers—New—both hand and power.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18, N. Y.
TF

FOR SALE

FOR SALE

1—Saveall 36" x 136" Cylinder Mold equipped with anti-friction bearing and couch roll.
1—Valley Iron screw press.
1—#2 Miami Jordan.
1—#9 Emerson Jordan for direct connection to a motor, requires use of 400 H.P. motor.
1—Shartle Bros. Triplex 8 x 18.
1—2000 lb. Holyoke Beater.
1—1000 lb. Dayton Beater.
1—Jones pulper—60 H.P. motor.
3—12 Plate Murray Dunbar Flat Screens.
1—18 Plate Flat Screen with scraper.
13—Driers 60" x 154".
23—Driers 36" x 82".
1—Buffalo Pump—5500 g. p. m., direct connected to 100 H.P. Motor (50' head).
3—Worthington turbine well pumps, 300 g.p.m.—for 14' and 16'—with motor.
1—#4 Roots-Connorsville Vacuum Pump.
1—60" Hudson Sharp 2 shaft slitter and winder.
1—72" Kidder two drum slitter and winder.
1—116" Moore & White slitter and winder. 4 Drum.
1—60" Moore & White slitter and winder set for 5/8" slits.
1—60" Moore & White slitter and winder set for 7/8" slits.
1—40" Brown Carver trimmer.
1—84" two press wet machine.
1—42" Johnstone Slitter and Winder.
1—114" Kidder 2-Drum Slitter and Winder.

Various sizes of Centrifugal Pumps. Write us regarding your particular requirements.

We are always in the market to purchase your surplus or idle machinery. What have you to offer?

J. J. ROSS COMPANY
250 Frelinghuysen Ave.
Newark 5, N. J.
Bigelow 3-3720 N-29

FOR SALE

1—Continuous New Type Pulper, complete with Centrifugal Pump, 25 ton capacity. Used very little
2—E. D. Jones Beater Rolls 54" dia. 48" face with machined slots, 64 fly bars 5/8" cutting edge. Like new.
3 Pair good heavy Press Frames and Housings. Also 6 pair Primary Roll Housings
100 Heat Treated Fly Bars, 60" long, 5/8" cutting edge, 5/8" center, 5/8" back edge, for E. D. Jones bandless rolls
120 Heat Treated Fly Bars, 5/8" cutting edge, 5/8" center, 5/8" back edge for Jones bandless roll, or will punch to fit any banded roll
6—Downingtown Centrifugal Stock Pumps, 10" inlet, 8" outlet, split casings
1—114" Langston Slitter and Winder
2—118" Vickery Felt Conditioners
1—108" Vivkery Felt Conditioner
Can shorten all of the above to fit your felts
1—17-C Mitts Merrill Shredder or Hog
1—50 H.P. General Electric Steam Turbine direct connected to Falk speed reducer. 3600 to 575 RPM. Used three years.
1—8 Roll Farrell Calender Stack 88" face, 18" bottom, 16" top, 9" intermediates, Warren doctors
1—8" x 10" Downingtown Triplex Stock Pump
3—New Morris Centrifugal Stock, 200 GPM, 75 ft. head, 5 H.P.
1—Ingersoll-Rand Centrifugal Water Pump, 1050 GPM 140 ft. head, direct connected to 50 H.P. Motor
1—Ingersoll-Rand Centrifugal Water Pump, 1900 GPM, 35 ft. head, direct connected to 15 H.P. Motor

OSBORNE PAPER MILL EQUIPMENT CO.
Fulton, N. Y.

FOR SALE

REVAMPING AND BUILDING MILL AND CAN OFFER FOR SALE

One large Breaker Beater complete
One small Beater Complete
1—60" Diameter X 90" Face cylinder mold
1—8x6 Shartle Duplex plunger stock pump
1—New pair cast steel double suspension spring type beater bearings for 5" diameter journal—Noble & Wood beater roll. Never used
1—Used old style lighter beam for 5" diameter journal Noble & Wood beater
1—New reinforced design lighter beam for 5" diameter journal—Noble & Wood beater roll. Pattern No. 662. Never used.
3—200 KVA —23000-2300/4000 volts transformers
60—60" Face steel dryer felt rolls—1—7/16" journals
1—60" Face cast iron taper pulley—2 15/16" bore taper 31"x28½"
4—60" diameter x 83" face dryers
1—8" to 10" Cox & Sons Pipe threading machine
1—60" Noble & Wood Impeller for circulation stock in beater.

A visit to the mill would prove profitable as we have many items for sale to numerous to mention. See our superintendent Mr. O. P. Fassett at our plant in Wallcomsac, New York.

WALLOOMSAC PAPER MILLS, INC.
Mills: Walloomsac, New York
Main Office: 25 Vanderbilt Avenue
New York 17, New York TF

FOR SALE

66" x 46"—Sheridan 4—Past Model #25 Die Cutter.
36", 48", 72" Automatic Power Paper Cutters.
1, 2 & 3 Color, Meisel Rotary Printers.
12" x 16" Kidder 2-color Printer with all Attach.
15½" x 18" — Seybold 4-Post Embosser, Elec. Heated.
46", 50", 56" Miehle, Printers & Die Cutters.
40" & 52" Single & Double, Roll Coaters.
50" Waldron 6-Roll Polisher Coater.
72" Four Bar Slitter & Creaser.
Several sizes of Slitters & Rewinders, Creasers and Scorers. Write for latest Bulletin No. 124, listing over 100 Paper & Board Converting, Finishing, Box Making & Packaging Machinery—now on our floor. All Rebuilt & Guaranteed.

SOUTH WABASH ENGINEERING CO.
2937 S. Wabash Ave., Chicago 16, Illinois
F-14

4—Taylor Stiles 15" Giant Rag Cutters with dusting and conveyor equipment.
4—Rotary Sheeters, 42", 60" and 84" Clarks and 68" wide Hamblet.
1—Used Valley Iron Works Pulp Screw Press with herringbone speed reducer. Excellent condition.
1—Nashua—Kalamazoo 67" Water Finish Machine and Eliminator for installation in waxing machine.
1—Complete equipment for making 12" wide household waxed paper rolls, 1—Brightwood box machine, 1—National Metal Edge and 1—Schultz automatic roll machine.
1—E. D. Jones Imperial Jordan with 5/16" solid steel fillings and extra new plug filling directly coupled to 150 hp G.E. AC motor. Capacity 60 tons 24 hours. A-1 condition.
1—60" Meisel Heavy Duty Shear Cut Slitter & Rewinder.

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y.
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Ross Paper Machinery Co., 265 Passaic St., Newark 4, N. J., Humboldt 2-2177

BEATERS
1—2500 lb. Downingtown Iron Tub.
2—1000 lb. Horne Iron Tub.
1—1200 lb. Holyoke Wood Tub.
1—2000 lb. E. D. Jones Iron Tub Beater.

CALENDER DOCTORS
1 set of 16 Warren Doctors 104" face with frames.
1 set of 8 Warren Doctors 88" face with frames.

CALENDER STACKS
1—6 roll Beloit. 110" face.
1—11 roll Pusey & Jones. 104" face.
1—9 roll Rice Barton 99" face.
1—3 roll Moore & White 86" face.
2—2 roll Holyoke 36" face.

CONVERTING EQUIPMENT
2—Hudson Sharp 63" Slitters and Folding Machines for converting facial tissue. With motors and starters.
1—Dietz 65" Toilet Converter. With motor and starter.
1—64½" Hudson Sharp Toilet and Toweling converter. With motors and starters.
3—Sanitary Napkin Machines. With motors and starters. Capacity 105 pads per minute each.
1—Bliss Double Head Stitcher.
1—Bliss Single Head Stitcher.
1—Bliss Box Assembling Machine.
1—66" Dietz Towel Winder.
4—Waterville Grinders.
1—36" Waldron Reeling Machine.
1—39" Dampening Machine.
1—36" Brush Coating Machine.
1—Copper Mixing Tank with agitator—40 gal.
1—Cast Iron Kettle 20" x 24" 2 outlets.

CONVEYOR
1—Standard Conveyor 30' long on wheels for handling bales of pulp. Direct connected to 5 h.p. motor.

DRYERS
1—48" diameter x 88" face.
4—60" diameter x 174" face framed and geared.
1—30" diameter x 102" face with bearings.
1—Beloit Yankee. 186" face, 12" diameter with Messinger Bearings.
18—36" diam. 82" face 2 deck frames.
40—38" diam. 96" face 2 deck frames.

EXTRACTOR ROLLS
1—Downingtown 24" diameter, 135" face, with rubber couch 18" diameter.

FESTOON DRYERS
100" Proctor & Schwartz
60" Proctor & Schwartz

FLAT SCREENS
1—Moore & White 8 Plate.
1—Moore & White 10 Plate.
1—Sandy Hill Packer 10 Plate.
1—Trimbey Pulp Screen 30 ton cap.

JORDANS
1—Dillon No. 2 Motor drive.
1—Appleton No. 2 motor drive.

KNIFE GRINDER
1—72" Seybold automatic used one year.

LATHE
1—Sidney Machine & Tool Co. quick change. 10' centers, 24" swing; 2 chucks; and Sace Blate.

MISCELLANEOUS
700—Cameron slightly used Slitter Knives—$1.00 each. Purchased from a war cancellation.
2—Yankee Dryer doctor oscillators (Beloit)
2—Nugeat Oil Filters (new).
2—Beloit Fourdrinier Shakes.

MOTORS
4—1000 h.p. motors, 2300 volts with all controls.
1—30 h.p. 600 R.P.M. 2300 V. 3 Ph. 60 cy.
1—40 h.p. 3600 R.P.M. 2300 V. 3 Ph. 60 cy.

PLATERS
2—Holyoke 2 Roll 18" dia. 36" face.

PULLEYS
185—Cone Lift and Solid Cast Iron Pulleys. *Various Sizes.*

PULP EQUIPMENT
Complete Ground Wood Mill—
4—Sandy Hill four pocket Grinders. Each direct connected to 1000 h.p. motor, 2300 volts. 27" stones. Spare stones, etc. Excellent condition. Will sell all or part.
2—Pusey & Jones vertical Digesters (welded) 7' dia., 24' high 125 lb. pressure.
8—Horizontal Digesters 15' diam. 47' face 150 lb. pressure.
3—Improved No. 2 Knotters.
1—Nichols-Herreshoff Lime Kiln.
1—Williams No. 30 Bark Hog.
1—Sumner Disc Barker 72" dia.
1—36" Bauer Bros. Single Revolving Disc Mill. Direct connected to 50 h.p. motor, 3 phase, 60 cycles, 220 volts, 1160 r.p.m.
1—Carthage 4 pocket 27" grinder. Ball bearing equipment.
1—126" face Kamyr Press.

PULPERS
1—E. D. Jones direct connected to 60 h.p. motor with starting equipment.
1—Sturtevant Bale Pulper with conveyor & motors used three years.
1—Voith Pulper 20 tons cap.

PUMPS
1—Frederick 400 g.p.m.—60' head.
1—Pusey & Jones 3" x 8" Stock.
1—DeLaval 6" x 6".
1—Oliziti Acid 3" Suction.
1—Midwest 6" stock pump.

REELS
2—Pusey & Jones 104" face 18" dia. bowls.
1—Pusey & Jones 115" face 18" dia. bowls.
1—2-bowl 100" face 20" dia. bowls.

REFINER
1—10" Wiener Refiner with Regulating Valves.

RIGHT ANGLE WORM GEAR DRIVES
1—Cleveland 2 H. P.—10 to 1 ratio.
1—Philadelphia 15 H. P.—60 to 1 ratio.
1—Oliver 5 H. P.—51 to 1 ratio.
1—Grant 2 H. P.—34½ to 1 ratio.
1—Cleveland 2.3 H. P.—40 to 1 ratio.
1—Cleveland 1.2 H. P.—60 to 1 ratio.
1—Grant 2 H. P.—7 to 1 ratio.
1—Philadelphia 2 H. P.—600 to 1 ratio.
1—Philadelphia 15 H. P.—60 to 1 ratio.

ROLL GRINDER
1—Lobdell Roll Grinder. Will take roll 24" diameter x 160" face.
1—Farrel Roll Grinder. Will take roll 28" dia. x 168" face, with motors, starters and crowning attachment.

ROLLS
315—Table, Dress, Felt, Wire, Breast and Calender Rolls. *Various Sizes.*

SATURATOR
1—Guyton-Cumfer 5 gates.

SAVEALLS
1—A. D. Wood cylinder 48" dia. 60" face.
1—Dorr Company #40 ADKA Saveall 340—440 DPM. Used 1 month.
1—Dorr Company #50 ADKA Saveall 550—680 DPM. Used 1 month.

SCREW PRESS
1—Valley Iron Screw Press. Used 2 years.

SLITTERS AND WINDERS
1—88" face, two drum Warren Slitter and Winder.
1—116" Moore & White 4 drum slitter and winder with motor and starter. Will rewind 50" diameter. Complete with 3 ton Sprague Electric Hoist.
1—50" Cameron #6 Slitter and Rewinder.

STOKERS
2—Iron Fireman Pneumatic Spreader Stokers for two—300 h.p. boilers. Complete with undergrates, fans, sly ash fans, weight lory, portable car unloader. All direct connected to motors with starters. Used 1 year.

STUFF PUMPS
7—10" x 20" Shartle triplex.
1—8" x 18" Shartle triplex.
1—12" x 16" Shartle triplex.
1—12 x 12 Goulds Triplex.
1—7" x 16" Shartle triplex.

THICKENERS
1—Shartle Bros. Thickener. Cylinder Mold 72" face x 36" diameter with 16" diameter couch.
4—Improved Paper Mchy. Co. Thickeners. Cylinder mold 132" face x 48" diameter, with 24" diameter couchs.

TRIMMERS
1—56" Smith & Winchester Undercut with motor.
1—30" Eureka Hand Operated.

TURBINES
1—Westinghouse Turbine Generator 3135 KVA—600 volts—3 phase—60 cycle—30 lb. back pressure.
1—General Electric Turbine Paper Machine Drive. 250 h.p.—350 r.p.m. 125 lb. steam pressure.

TWISTING MACHINES
1—36 Spindle Brownell Twister with motor.

UNWINDERS
1—52" Johnstone Uniform Tension Unwinder with auto, hydraulic brakes. Used 6 months.
1—42" John Waldron Unwinder. Used 1 year.

VACUUM PUMPS
1—14" x 20" Connersville.
1—12" x 18" Connersville.

WASHERS (Beaters)
1—54" face—43" diam. with rigging.
1—52" face—52" diam. with rigging.

WELL PUMP
1—A. D. Cook 100 g.p.m. 175' head, 70 feet in well 6" drop in pipe—5½" bronze double acting cylinder. Direct connected to 10 h.p. motor.

YANKEE DRYER
1—Beloit 186" face 12' diameter with Messinger Bearings.

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LIBERAL ALLOWANCES FOR YOUR USED MACHINERY.
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FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore, 30, Md. TF

FOR SALE — Two Waterbury Speed Drives, Size 20, Type C, one rebuilt. Frank H. Davis Company, 175 Richdale Ave., Cambridge, 40, Mass. D-13

FOR SALE—64" Seybold Twentieth Century Cutter, gauranteed to be in good working order. Address Box 45-777 care Paper Trade Journal. N-29

FOR SALE—1 Board Mill, machine trims 38"; 1—72" Hamblet Sheet Cutter; 3—No. 6 Nash Pumps; 3 and 4 Effect Evaporators; 63 and 76" S&W Ream Cutter; 72 and 90" Fourdrinier Parts; 1—New 38" Plater. Address Frank H. Davis Company, 175 Richdale Ave., Cambridge 40, Mass. N-29

WANTED

WANTED

2-machine mill for toweling and tissue, either in New York state or in New England. Address Box 45-766 care Paper Trade Journal. D-27

FOR SALE

FOR SALE

One Moore and White, four drum rewinder complete with driving motors and control equipment

Separate slitting equipment.

126"—Trim
60"—Diameter of rolls
6—Number of rolls
18"—Diameter of winding drum roll
0'—1000' F.P.M.
4" & 3"—Expansion winding shafts

Control Equipment

1—60 H.P. 440 volts, 3 phase, 60 cycle, Westinghouse hand operated, reduced voltage starter for motor generator set.

1—Reliance electric, motor generator set mounted on common base consisting of 1—60 H.P., 440 volts, 60 cycle, 3 phase, 1800 R.P.M. A.C. motor, 1—40 K.W., 230 volts D.C., Generator, 1 Exciter, 3 K.W., 230 volts D.C.

4—Reliance electric motors 230 volts D.C. driving winder drum rolls.

1—Reliance electric motor 230 volts D.C. driving slitters.

This equipment is in good mechanical condition.

THE GARDNER-RICHARDSON COMPANY

N-29

WANTED

WANTED—Good used drum type rewinders. Interested in sizes from 66" to 96". Address Box 45-742 care Paper Trade Journal. N-29

WANTED—Seybold, Sheridan or Oswego Cutter, 50" minimum; Seybold power round corner cutter; right angle corner cutter; steel rule die press about 28 x 40"; high die press about 28 x 40". Address Box 45-741 care Paper Trade Journal. N-29

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers Address Box 44-835 care Paper Trade Journal.

IN the market for one used but in first serviceable condition Paper and Cloth-gumming Machine, 63" wide. Send proposals to Mr. Ciro A. Martinez, Purchasing Agent, Apartado Postal No. 755, Monterrey, N. L., Mexico. D-20

WANTED—Brightwood Box Machine. Address Box 44-836 care Paper Trade Journal. tf

WANTED—Cameron Type Slitter — width — minimum 62"—maximum 76"—state make—serial No.—condition and price with reply. Address Box 45-628 care Paper Trade Journal. N-29

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED—AGENCY AVAILABLE IN BELGIUM. Will be in U. S. in January with view to purchasing for Belgian Syndicate—principally interested in box boards, wrapping papers, writing papers, bank and unprinted wall papers. Address Box 45-768 care Paper Trade Journal. N-29

WANTED—Paper Towel Converting Machinery —all types and folds, mainly C fold. Address Box 45-771 care Paper Trade Journal. D-6

WANTED—Flat and Square Bag also Sack Machines. In your reply, please give make, price and condition of machine. Address Box 45-773 care Paper Trade Journal. D-6

WANTED—Fourdrinier end to form sheet to trim 81 inches or more, or complete fourdrinier machine with Yankee Dryer. Address Box 45-774 care Paper Trade Journal. N-29

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GOVERNMENT BIDS

PROPOSALS

FOR FURNISHING

PAPER AND ENVELOPES FOR THE U. S. GOVERNMENT PRINTING OFFICE

SEALED PROPOSALS will be received until 10 a. m., December 10, 1945, in the room of the Joint Committee on Printing, in the Capitol, Washington, D. C., for furnishing the paper for the public printing and binding, and blank paper and plain envelopes for the use of the Government departments and establishments in the District of Columbia, for the terms of 3 months for paper and 6 months for envelopes beginning January 1, 1946, deliveries to be f. o. b. Government Printing Office Warehouse or warehouse siding, Washington, D. C. The proposals will be opened in the presence of and the award of contracts made by the Joint Committee on Printing to the lowest and best bidders for the interest of the Government whose bids are in conformity with the requirements of the proposals. The Committee reserves the right to reject any or all bids, or to accept any bid or any part and reject the other part, if, in its opinion, such action would be in the interest of the Government.

Blank proposals containing the instructions, schedule, and specifications, may be obtained by addressing A. E. Giegengack, Public Printer, Washington, D. C.

Contracts will be entered into for supplying the quantities required, whether more or less than the estimates, as provided in paragraph 15 of the proposal for paper and paragraph 13 of the proposal for envelopes.

The approximate estimated quantities set forth in detail in the schedules comprise:

PAPER

500,000 pounds newsprint paper; 200,000 pounds telephone book news; 1,950,000 pounds machine-finish book paper; 200,000 pounds English-finish book paper; 2 600,000 pounds offset book paper; 50,000 pounds antique book paper; 50,000 pounds light-weight machine finish book paper; 90,000 pounds 50% antique book paper; 800,000 pounds supercalendered book paper; 700,000 pounds machine-coated book paper; 40,000 pounds dull coated book; 1,600,000 pounds mimeograph paper; 200,000 pounds duplicator copy paper; 100,000 pounds U S M O Safety writing paper; 7,400,000 pounds writing paper; 500,000 pounds map paper; 610,000 pounds manifold paper; 1,720,000 pounds bond paper; 1,150 000 pounds ledger paper; 790,000 pounds index paper; 165,000 pounds cover paper; 150,000 pounds manila paper; 40,000 pounds drumhead manila paper; 300,000 pounds kraft paper; 40,000 pounds blotting paper; 100,000 pounds tag board; 50,000 sheets railroad board; 250,000 pounds wood cardboard; 3,000,000 pounds postal card paper; 100,000 pounds news board; 270,000 pounds binder's board; 160,000 pounds chestnut coverboard.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

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17,100,000 Kraft; 5,550,000 Writing, Chemical Wood, white and colored; 270.000 100% Writing, white; 1.050,000 25% Bond, white; 400,000 100% Bond, white.

By direction of the Joint Committee on Printing.

A. E. GIEGENGACK,
Public Printer.

WASHINGTON, D. C.
November 26, 1945. D-6

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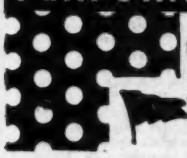

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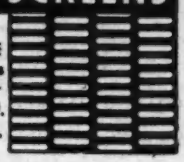

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Bibliography of Papermaking, Vol. 1 1900-1928 — $10.00

Paper Making Materials (Reading List) By Clarence J. West, Ph.D. — $3.00

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Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
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AGITATORS
Appleton Machine Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
H. K. Porter Company Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

AIR CONDITIONING
Steamaire Company

BAG MACHINES
Thomas W. Hall Co., Inc.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
Fibre Making Processes, Inc.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BEARINGS
Black-Clawson Company
Jones, E. D. & Sons Co.
The Manhattan Rubber Mfg. Co.
Montague Machine Works
Rollway Bearing Co.
Shartle Brothers Machine Co.
SKF Industries Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Woods' Sons Company

BEATERS & JORDANS
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Herman Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works Inc.
Downington Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Simonds Worden White Co.
Valley Iron Works Co.

BELTING
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
Graton & Knight Company
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machinery Corp.

BLEACHING APPARATUS
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Pennsylvania Salt Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BOTTOMS
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.
Valley Iron Works Co.

BUILDERS—PAPER MILLS
Merritt-Chapman & Scott Co.

CALENDERS
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdel Car Wheel Co.
Moore & White Co.
Black-Clawson Company
Perkins & Son, Inc., B. F.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASEIN
Packing Products Co.

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Fort Pitt Steel Casting Co. , Div. H. K. Porter Company, Inc.
Grinnel Company
Hamblet Machine Co.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross, J. O. Eng. Co.
Shartle Brothers Machine Co.

CHEMICALS
Amer. Cyanamid & Chem. Corp.
American Resinous Chemicals Corp.
Ansul Chemical Co.
Calco Chemical Co.
Diamond Alkali Co.
Dispersion Process Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Geigy Co., Inc.
Gotteeman & Co.
Glidden Corp.
Hooker Electrochemical Company
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Stauffer Chemical Company
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemical Corp.

CLEANING MATERIALS
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
E. I. du Pont de Nemours & Co., Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Nichols Engrg. & Research Corp.
Oakite Products, Inc.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp.
J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Stearns Magnet Mfg. Co.
Stearns Magnetic Mfg. Co.
T. B. Wood's Sons Company

COATING MATERIAL
Glidden Corp.

COATING MACHINERY
Horton Mfg. Co.
Hudson Sharp Machine Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machinery Corp.

CONSTRUCTION ENGINEERS
Merritt-Chapman & Scott Corp.

CONSULTING ENGINEERS
W. H. L. D. Betz
Frederic C. Clark
Ferguson, Hardy S.
Hardy, George F.
Johnson & Wierck, Inc.
The Kohler System Company
Main, Inc., Chas. T.
Harold R. Murdock
J. E. Sirrine & Co.
Stone & Webster Engrg. Corp.

CONTROLS
The Bristol Company
Stickle Steam Specialties Co.

CONVEYORS
Black-Clawson Company
Murray, D. J. Mfg. Co.
Ross Engineering Corp., J. O.

CORES
Elixman Paper Co.
Sonoco Products Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Walker-Goulard-Plehn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Lovejoy Flexible Coupling Co.
Moore & White Co.
Noble & Wood Machine C.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Corporation
T. B. Wood's Sons Company

CRANES
Northwest Engrg. Co.

CUTTERS
Thomas W. Hall Co.
Noble & Wood Mach. Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DE-INKING
Kinsley Chemical Co.

DIGESTERS
H. K. Porter Company Inc.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers
United States Rubber Co.
Westinghouse Electric Corporation

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.
J. J. Ross Company
Ross, J. O. Engineering Corp.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Horton Manufacturing Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric Corporation

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Fibre Making Processes, Inc.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EQUIPMENT INSTALLATION
Merritt-Chapman & Scott Corp.

EVAPORATORS
Black-Clawson Company
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Builders-Providence, Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co. Inc.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Suply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Woodward, Baldwin & Co.

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
American Resinous Chemicals Corp.
Johns-Manville Sales Corp.
W. H. Loomis Talc Corp.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Moore & White Co.
J. O. Ross Engrg. Corp.
Worthington Pump & Machy. Corp.
Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FRICTION MATERIALS
Johns-Manville Sales Corp.

GEARS
Black-Clawson Company

WHERE TO BUY

De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Norton Company
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Fibre Making Processes, Inc.
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Worthing Pump & Mchy Corp.

HOISTS
Appleton Machine Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

HUMIDITY CONTROL
Steamaire Company

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
N. P. Bowsher
The Bristol Company
Builders-Providence, Inc.
The Foxboro Company
General Electric
W. & L. B. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taber Instrument Corp.
Taylor Instrument Cos.
Testing Machines Inc.
Wallace & Tiernan Instrument Co.

INSULATION
Johns-Manville Sales Corp.

JORDAN FILLINGS
Appleton Machine Co.
Behr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
W. H. & L. D. Betz
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

LUBRICATORS
Hills-McCanna Co.

MATERIAL HANDLING
Northwest Engrg. Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Walker-Goulard-Plehn Co.

MIXERS
H. K. Porter Company
Youngstown Welding & Engrg. Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.

MOISTURE CONTENT CONTROL
Steamaire Company

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
Johns-Manville Sales Corp.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPERMILL BUILDERS
Merritt Chapman & Scott Corp.

PAPER TUBE MACHINERY
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Grinnell Company
Johns-Manville Sales Corp.
Shartle Brothers Machine Co.
Stowe-Woodward Inc.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

PLATERS
Perkins & Son, Inc., B. F.

PLATES
Black-Clawson Company
Hendrick Mfg. Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer G.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Elof Hanson, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PULPSTONES
Norton Company

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hills-McCanna Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Steamaire Company
Warren Steam Pump Company
Worthington Pump & Machinery Corp.

RECOVERY SYSTEMS
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp, J. O.
Valley Iron Works Co.

REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Stickle Steam Specialties Co.
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric Corporation

RESINS
American Cyanamid & Chemical Corp.
American Resinous Chemicals Corp.
Glidden Corp.
The Resinous Products & Chemical Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
Roehlen Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
Stowe-Woodward Inc.
United States Ruber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Stowe-Woodward Inc.
Youngstown Welding & Engrg. Co.

ROLL STANDS
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROOFING MATERIALS
Johns-Manville Sales Corp.

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

SCALES
Builders-Providence, Inc.
Merrick Scale Mfg. Co.

Screen Plates
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.

SIZING
American Cyanamid & Chemical Co.
American Resinous Chemicals Corp.
Black-Clawson Company
The Dow Chemical Company
du Pont, E. I., de Nemours & Co.
Glidden Company, Soya Products Div.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Philadelphia Quartz Co.
Pioneer Salt Company
Socony-Vacuum Co.
Stein, Hall & Co., Inc.

SLITTERS
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SOLENOID VALVES
Steamaire Company

WHERE TO BUY

SPRAYING EQUIPMENT
Steamaire Company
The Spray Engineering Co.

STAINLESS STEEL
Allegheny Ludlum Steel Co.
Eastern Stainless Steel Corp.
Industrial Steels, Inc.

STARCH
American Cyanamid & Chemical Corp.
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

STEAM SPECIALTIES
Johnson Corp.
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

STRAPPING & STRAPPING MACHINES
Acme Steel Company
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

SULPHUR
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

SULPHUR DIOXIDE
Ansul Chemical Company

TALC
American Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.
International Talc Company

TANKS
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Stowe-Woodward Inc.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

THICKENERS, DECKERS & SAVE-ALLS
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

TITANIUM
E. I. Du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

TOOLS
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

TRUCKS
Automatic Transportation Co.

TRAPS
Armstrong Machine Works
Crane Co.
Grinnel Company
Johnson Corporation
Shartle Bros. Mch. Co.

TUBE MACHINES
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Rodney Hunt Machine Co.
Noble & Wood Machine Co.
Shartle Brothers
Valley Iron Works Co.

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Hunt, Rodney, Mach. Co.
Westinghouse Electric Corp.
Worthington Pump & Machinery Corp.

USED EQUIPMENT
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Ross Paper Machinery Co.
Shartle Brothers Machine Co.

VALVES
The Bristol Company
Crane Company
Dilts Machine Works
Fibre Making Processes, Inc.
The Foxboro Company
Hills-McCanna Co.
E. D. Jones & Sons Co.
Kennedy Valve Mfg. Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Permutit Company
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Stickle Steam Specialties Co.
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

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Union Machine Co.
Union Screen Plate Co.

WASHERS
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

WATER CONDITIONING
The Permutit Company

WAXING MACHINERY
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
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Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WINDERS AND REWINDERS
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

WIRES
Appleton Wire Works
Black-Clawson Company
Bulkley, Dunton Pulp Co., Inc.
Cheney Bigelow Wire Works
Hayden Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Shartle Brothers Machine Co.

ALPHABETICAL INDEX TO ADVERTISERS IN THIS ISSUE

A

Allis-Chalmers Mfg. Co. 3
American Colloid Company 41
American Cyanamid & Chem. Corp. 26
Appleton Wire Works, Inc. 41
Appleton Woolen Mills 47
Asten Hill Mfg. Co. .....Front Cover
Aktivin Corp. 15

B

Betz, W. H. & L. D. 47
Bird Machine Co. 11
Black-Clawson Co. 43

C

Cameron Machine Co. 41
Classified Advertising 42
Crane Company 4

D

DeLaval Steam Turbine Co. 47
Dilts Machine Works 43
Downingtown Mfg. Co. 2

E

Elixman Paper Core Co., Inc. 37

F

Ferguson, Hardy S., & Co. 47
Foster Wheeler Corp. 23
Foxboro Company 51

G

Geigy Company 47
Getz Bros. & Company 35
Gibbs-Brower Co., Inc. 44
Glidden Co., Soya Prod. Div. 19
Gurley, W. & L. E. 39

H

Hall, Thomas W., Company 44
Hansson, Elof, Machy. Dept. 35
Hardy, George F. 47
Harrington & King Perforating Co. 41
Hendrick Mfg. Co. 47

K

Kinsley Chemical Co. 41

L

Langston Co., Samuel M. 39
Lyddon & Company 25

M

Main, Inc., Chas. T. 47
Mead Corporation 39
Merritt-Chapman & Scott Co. 47
Michigan Steel Casting Co. 47
Moore & White Company 47
Murdock, Harold R. 47

P

Parsons & Whittemore, Inc. 25
Pennotex Oil Corp. 41
Pennsylvania Salt Mfg. Co. 21
Potdevin Machine Co. 41
Price & Pierce, Ltd. 39

R

Raymond Service, Charles P. 42
Ross Paper Machinery Co. 45
Ross, J. J., Company 44
Rotogravure Engrg. Co. 47

S

Shartle Bros. Machine Co. 43
Smith & Winchester Mfg. Co. 41
Spray Engrg. Company 5

T

Tidewater Assoc. Oil Co. 41

U

Union Screen Plate Co. 37
United Carbon Company 39

V

Vanderbilt, R. T., Co. 6

W

Waterbury Felt Co. 41
Westinghouse Electric Corp., Back Cover
West Virginia Pulp & Paper Co. 37

Z

Zwecker, William R. 47

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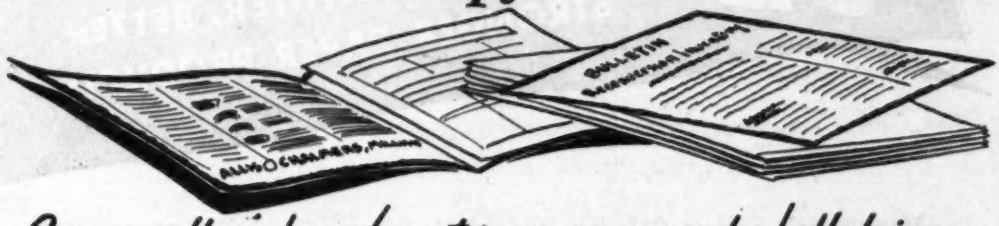

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